DOCUMENT RESUME

ED 116 426 EC 080 913

AUTHOR	Weiss, Karen L.; And Others
TITLE	Characteristics of Young Deaf Children and Early Intervention Programs. Research Report 91.
INSTITUTION	Minnesota Univ., Minneapolis. Research, Development, and Demonstration Center in Education of Handicapped Children.
SPONS AGENCY	Bureau of Education for the Handicapped (DHEW/OE), Washington, D.C.
BUREAU NO	332189
PUB DATE	Aug 75
GRANT	OEG-09-332189-4533(032)
NOTE	200p.; For related information see ED 071 239, 089 525, and 111 119; Best available copy
EDRS PRICE	MF-$0.76 HC-$9.51 Plus Postage
DESCRIPTORS	*Academic Achievement; Aurally Handicapped; Cognitive Development; Communication Skills; *Deaf; Early Childhood Education; Educational Methods; Exceptional Child Research; Language Development; *Longitudinal Studies; Parent Attitudes; *Preschool Education; Program Effectiveness; *Program Evaluation

ABSTRACT

Presented is the fifth in a series of reports on a 4-year longitudinal evaluation of preschool programs for hearing impaired children. It is explained that the seven programs studied emphasize either an oral-aural, Rochester (oral-aural plus finger spelling), or total communication method of instruction; and that the current report focuses on the characteristics of the sample (60 Ss) as a whole. Included in the report are a brief review of literature on preschool programs for the deaf, and descriptions of the programs and subjects studied. Reported are results of the following types of evaluation: Illinois Test of Psycholinguistic Abilities, academic achievement, communication battery, articulation, cognitive development measures, Matching Familiar Figures Test, regular class subjects, Brown Parent Attitude Scale, Semantic Differential, and classroom observation. Major study findings are summarized such as that reading skills were comparable to those of hearing peers, and that there was an overall lack of improvement in articulation scores across the 3 years. Appendixes include examples from some assessment instruments used in the study, the Parent Information and Attitude Scale, and longitudinal test data for Ss with unique class placement. (LS)

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RESEARCH REPORT # 91

Project No. 332189
Grant No. OE-09-332189-4533 (032)

CHARACTERISTICS OF YOUNG DEAF CHILDREN AND EARLY INTERVENTION PROGRAMS

BEST COPY AVAILABLE

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August 1975

The research reported herein was performed pursuant to a grant from the Bureau of Education for the Handicapped, U.S. Office of Education, Department of Health, Education, and Welfare to the Center of Research, Development and Demonstration in Education of Handicapped Children, Department of Psychoeducational Studies, University of Minnesota. Contractors undertaking such projects under government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official position of the Bureau of Education for the Handicapped.

EC 080 913

Department of Health, Education and Welfare

U. S. Office of Education

Bureau of Education for the Handicapped

RESEARCH, DEVELOPMENT AND DEMONSTRATION CENTER IN EDUCATION OF HANDICAPPED CHILDREN

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The University of Minnesota Research, Development and Demonstration Center in Education of Handicapped Children has been established to concentrate on intervention strategies and materials which develop and improve language and communication skills in young handicapped children.

The long term objective of the Center is to improve the language and communication abilities of handicapped children by means of identification of linguistically and potentially linguistically handicapped children, development and evaluation of intervention strategies with young handicapped children and dissemination of findings and products of benefit to young handicapped children.

Acknowledgments

The authors would like to thank the following people at each program who were especially helpful during the research visits: Wendell Duncan and Jean Joseph, American School for the Deaf; Dorine Cunningham, Callier Center for Communication Disorders; Margaret Kent, William Sherman, and Dr. Alfred White, Maryland School for the Deaf; Jayne Nelson and Randy Genrich, Minneapolis Public School System; James Little, Roz Bradford and Donna Groves, New Mexico School for the Deaf; Eleanor Scouten, Rochester School for the Deaf; Jan Hopke and Mollie Williams, St. Paul Public School System, along with all the secretaries, teachers and teacher aides at the various participating programs whose assistance facilitated the completion of our testing. We would also like to express our appreciation to Diane Fjeld, Hamilton School, Anoka and Albert Esterline and Cara Conklin, Minnesota School for the Deaf for their cooperation in allowing us to field test materials with children in their respective programs. Thanks are extended to Audrey Thurlow, Karen Pugh and DeAnna Gehant for their assistance with the preparation of the manuscript.

Appreciation and thanks are also due to Nancy Lindenberg, Pat Drury, Jackie Larson and Mary McCune who participated in tape transcription and data analysis.

Very special thanks go to Karin Eyles and Cindy McIntyre for their extensive work piloting and modifying various tests, reviewing relevant literature, preparing materials and collecting data. In general, they deserve credit for the often tedious and difficult initial

phases of the first three years of the project.

The authors would also like to express their appreciation to Dr. Barbara Best, former Research Associate in the RD&D Center, who devised, analyzed and wrote the results for the Cognitive Development Measures.

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Chapter 1

INTRODUCTION

In the fall of 1969, a longitudinal evaluation of preschool programs for hearing impaired children was begun. Its purpose was to assess the effectiveness of various early intervention strategies currently being employed in the education of the deaf in order to facilitate identification and isolation of variables predictive of success.

The initial year of the evaluation was devoted to organizing and to planning during which formal commitments were given and received from participating programs following visitations and/or discussions with administrators and personnel. The majority of time during this first year was spent in the development and piloting of assessment techniques. Testing was facilitated by the proximity and cooperation of two preschool programs for the hearing impaired in the Minneapolis-St. Paul area.

Because deafness is a low incidence handicap, problems of evaluation are intensified. For this reason the study extended over a wide geographical area in order to encompass the desired variety of programs. The seven programs which participated in the evaluation represent a diversity of educational methodologies, organizational structures, and philosophies in the education of the deaf. Program methodologies include oral-aural, total communication and the Rochester method.

During the course of the evaluation instruments were constructed and revised to assess the children's communicative abilities, both receptive and expressive, their articulatory skills, academic achievement, level of cognitive functioning and psycholinguistic abilities. Additional scales to evaluate parental attitude, classroom structure and communication within the classroom (between students as well as between student and teacher) were also developed and adapted for use in the evaluation. The titles of those instruments administered are summarized in Table 1.

For an objective evaluation it was deemed mandatory to have input from highly qualified professionals reflecting various philosophical viewpoints. Therefore, a balanced committee representing the disciplines of Audiology, Psychology, and Psycholinguistics was convened to provide technical assistance and maintain objectivity. Throughout the evaluation, members of this committee continued to provide their assistance and expertise, serving as ongoing consultants and resource personnel.

In the subsequent four years, 1970-1974, test data were collected on the longitudinal sample. Each spring (March through May), visits to the seven programs were made by a team of investigators who tested the students and observed in their classrooms. In 1970 and 1974 fall visits were made to administer the Leiter International Performance Scale and the Performance section of the Weschler Intelligence Scale for Children (WISC), respectively. Following compilation of each year's data, an annual research progress report was published (Moores & McIntyre, 1971; Moores, McIntyre & Weiss, 1972; Moores, Weiss & Goodwin, 1973; 1974). These annual reports from the evaluation emphasized methodological, etiological and programmatic comparisons. The current report will focus on the characteristics of the sample as a whole since the authors feel

Table 1

Instruments Employed in the Longitudinal Evaluation of Preschool Programs of Hearing Impaired Children

	School Year Administered			
Instrument	1970-71	1971-72	1972-73	1973-74
Leiter International Performance Scale	X			
Illinois Test of Psycholinguistic Abilities (ITPA)	X	X	X	X
Metropolitan Reading Tests (MRT)			X	
Metropolitan Achievement Tests (MAT)				X
Receptive Communication Scale (Core Items)		X	X	X
Receptive Communication Scale (Passives, Negatives and Verb Tense Supplement)				X
Expressive Communication Scale			X	X
Articulation Measure		X	X	X
WISC Performance Scale				X
Matching Familiar Figures Test			X	
Measures of Early Cognitive Development			X	X
Brown Parent Attitude Scale	X	X	X	X
Parent's Semantic Differential Scale	X	X	X	X
Classroom Communication Analysis	X	X	X	X
Classroom Observation Schedule	X	X	X	X

that the diversity of the subjects has provided a sample generally representative of profoundly hearing impaired preschool children. The participating subjects received services in a variety of settings including public school based programs, residential day settings, full-time residential settings, and settings in which children were mainstreamed into regular class settings. A breakdown of student placement within these categories as of spring 1974 is presented in Table 2.

Review of Literature

The major impetus for the present project lies in the belief that there are extremely important and complex issues in the education of preschool deaf children which should be investigated. These include questions of methodology, placement, program orientation, structure and emphasis. It is hoped that the broad foci of the present project will impel other researchers to address themselves to these and related issues of practical importance in the education of young deaf children. To date, relatively few investigations of such proportion have been undertaken.

The apparent lack of comprehensive data may be traced to two primary sources. First, the numerous problems in evaluating the effectiveness of preschool programs are compounded by the added dimension of deafness. The difficulty in assembling a sufficiently large sample, the overriding factor of effectively communicating with the young deaf child, and the lack of evaluation with instruments appropriate for use with a population of preschool deaf children are some of the difficulties encountered

Table 2

Administrative Organization of Services

Program	Residential Schools				Pupils in Public School Classes for the Deaf or Hearing		Pupil Integrated into Hearing Class		1/2 day Hearing and 1/2 day Deaf	
	Day Students		Residential Students							
	Children	hour/wk.	Children	hours/wk.	Children	hours/wk.	Children	hours/wk.	Children	hours/wk.
Program A	5	30	1	30						
Program B					9	27 1/2	3	27 1/2		
Program C	8	27 1/2								
Program D					5	33 3/4	1 1 *4	15 27 1/2 33 3/4	2	33 3/4
Program E	1	22 1/2	4 2	20 22 1/2						
Program F	4	27 1/2	4	27 1/2						
Program G					1 1	12 1/2 27 1/2	3	27 1/2	1	27 1/2
Totals	18		11		16		12		3	

*All four children are integrated into the same hearing class with a teacher of the deaf working in the classroom.

in the collection of empirical data.

Another and perhaps even more inhibiting factor is the highly emotional nature of the question of educational methodology with young deaf children. In a report to the Secretary of Health, Education and Welfare (Babbidge, 1965), it was noted that for more than 100 years emotion has served as a substitute for research in the education of the deaf. Some educators firmly believe that the use of any kind of manual communication will prevent the development of speech and language and result in a mute subculture, while others believe just as firmly that depriving a deaf child of manual communication will cause irreparable linguistic, educational, and emotional damage. Given such a climate, most researchers prefer to investigate other questions in the area of deafness.

Neither concern should impede the objective analysis of the evaluation of young deaf children. Educational decisions must be made daily, and if little information exists, these decisions will continue to be made on the basis of emotion and other less reliable factors. The necessity for sound, empirically based information to assist in the educational decision making process becomes even more urgent in light of the recent proliferation of preschool programs for the hearing impaired.

According to information presented in the Annual Directory of Programs and Services of the American Annals of the Deaf, the number of deaf children served by preschool programs has increased tremendously in the past ten years (Doctor, 1962; Craig, 1975) to the extent that the majority of deaf children in urban areas are likely to have been identified and to have received some treatment before entering school. Unfortunate exceptions are very young Chicano, Black and Indian children, who are less frequently diagnosed and served.

Existing studies tangential to the focus of the current inquiry have dealt with various aspects of educating the deaf including the academic achievement of such students, effectiveness of preschool programs, methodological comparisons and studies of deaf children of deaf parents. A review of the academic achievement of deaf students leads to discouraging conclusions. There is evidence to support the assertion that the majority of graduates of educational systems for the deaf are undereducated. Deaf adolescents and adults of average intelligence in North America and Europe are reportedly unable to read at the fifth grade level (Furth, 1966; Norden, 1970; Wrightstone, Aranow & Moskowitz, 1963), lack basic linguistic skills in the language of the hearing community (Moores, 1970a; Simmons, 1962; Tervoort & Verbeck, 1967), and are incapable of receiving and expressing oral communication on anything but an elementary level (Montgomery, 1966; Report of the Chief Medical Officer of the British Department of Education and Services, 1964).

Studies focusing on evaluation of preschool programs have reported similar results suggesting few or no differences between deaf children with preschool training and those who have not been involved in preschool programs. Craig (1964) found no differences of speechreading skills between children with preschool experiences and those with no such experience.

In a comparison between children who received preschool training and those who did not, Phillips (1963) found that by age nine no differences existed between preschool and nonpreschool groups in the areas of language arts, arithmetic and socialization.

McCroskey (1968) found some differences between children who participated in a home centered program with an auditory emphasis and a control group of children who received no preschool training. Differences favored the control group; however, since the hearing losses of the control were less severe and the IQ somewhat higher, it is difficult to generalize from these results.

As part of a follow-up study of graduates of the Tracy Clinic from 1944-1968, Vernon and Koh (1971) matched graduates with non-preschool deaf controls in age, IQ, and sex. There were no differences between subjects trained at the Tracy Clinic and those with no preschool experience in speech, speechreading, academic achievement or reading.

These above cited research efforts conducted by nonaffiliated investigators compare children trained in oral-only preschools with those who received no preschool training (Craig, 1964; Phillips, 1963); McCroskey, 1968; Vernon & Koh, 1970). These inquiries illustrate the absence of consistent findings of superiority between the preschool and non-preschool groups.

There is also a body of research conducted by individuals evaluating the effectiveness of programs with which they have been closely affiliated (Hester, 1963; McCroskey, 1968; Simmons, 1962; Craig, Craig & DiJohnson, 1972; McConnell & Horton, 1970). In many cases these reports are basically explanations and justifications of certain procedures. Such evaluations serve a useful purpose, but they are usually limited to one program and raise a number of problems, the greatest of which is the difficulty of assignment and treatment of children, that is, effectively accommodating experimental and control subjects within the same program.

With the exception of the findings of the present study (Moores & McIntyre, 1971; Moores, McIntyre & Weiss, 1972; Moores, Weiss & Goodwin, 1973; Moores, Weiss & Goodwin, 1974) very few studies directly comparing the efficiency of methodologies have been undertaken. One such study was conducted by Quigley (1969) who reported that preschool children taught by the Rochester Method (the simultaneous use of speech and fingerspelling) were superior to children taught by the Oral-Only approach in measures of speechreading, reading, and written language. Hoemann (1972) investigated the use of fingerspelling versus signing by 6- to 12-year-old pupils in a referent description task requiring subjects to label pictures of common objects for a peer receiver. The findings illustrated that facility with fingerspelling contributed to vocabulary acquisition and mastery. Results from a 1973 (Hoemann, 1974) follow-up study indicated that the impact of fingerspelling on language behavior is greatest when implemented at the onset of the student's formal education.

Recent research on the relative superiority of deaf children of deaf parents has had a great and growing impact on the field. These findings suggest that deaf children of deaf parents tend to be better adjusted, to achieve academically at a higher level, to have better language abilities, and to have equivalent speech development in comparison to deaf children of hearing parents (Best, 1972; Meadow, 1967;

Quigley & Frisina, 1961; Stevenson, 1964; Stuckless & Birch, 1966; Vernon & Koh, 1970). Of great importance is the evidence that deaf children of deaf parents increase their relative advantage with age so that by late adolescence their superiority is much more pronounced.

In view of these findings in favor of deaf children of deaf parents, which may have been the result of an exposure to signs from birth, and because studies of Oral-Only programs have shown no differences or illustrated only temporary effects, it has been argued that many preschool programs have failed because they have been restricted to Oral-Only instruction (Vernon & Koh, 1971). Thus, it has been hypothesized that perhaps the addition of manual communication would improve results. Such reasoning has led to the development of many recent preschool programs utilizing a system dubbed Total Communication which involves the use of signs, fingerspelling, and oral-aural communication.

Although the evidence of the superiority of deaf children of deaf parents is substantial, it does not necessarily follow that the use of manual communication in preschool programs will produce better results. At present, no data exist, again excepting the present study, on the comparative efficacy of Total Communication as opposed to either an Oral-Aural method or the Rochester Method. (For a comprehensive treatment of research on manual communication, the reader is referred to reviews by Moores, 1971, 1974.)

The rationale for this inquiry into the effectiveness of preschool programs is based on a modification of Cronbach's (1957) Characteristics by Treatment Interaction Model. The model is based on the thesis that when results of educational research consist entirely of comparisons between groups they are of limited value. Such investigations may be exact or orderly and produce results but they frequently mask important interactions between individuals and different types of treatments or educational programs. The search should not be for the "best" method for all children but rather for the preferred method for a particular child at a particular stage. (For a more detailed explanation of this rationale see Moores, 1970b.) As previously noted, annual research reports emanating from the present project have focused on methodological, etiological and programmatic comparisons. The current report, while briefly summarizing these comparisons, will concentrate on the performance of the group as a whole and the interaction of various skills assessed in the evaluation.

Chapter 2

PROGRAM AND SAMPLE DESCRIPTION

As has been noted, the seven programs participating in this preschool evaluation were specifically selected to provide a diverse representation of approaches to educating the preschool deaf child.[1] The authors are aware of differences that exist in the definitions of these varied methods of instruction, especially in reference to the term "Total Communication." However, for purposes of the present study the methodologies have been defined as follows:

1. Oral-Aural Method. In this method, the child receives input through speechreading (lipreading) and amplification of sound, and expresses himself through speech. The use of signs and fingerspelling are not part of the educational process.
2. Rochester Method. This is a combination of the Oral-Aural Method plus fingerspelling. The child receives information through speechreading, amplification and fingerspelling, and expresses himself through speech and fingerspelling. When practiced correctly, the teacher spells every letter of every word in coordination with speech.
3. Total Communication. This approach, also known in this context as the Simultaneous Method, is a combination of the Oral-Aural Method plus fingerspelling and signs. The child

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[1] The seven participating programs are as follows: American School for the Deaf, West Hartford, Connecticut; Callier Center for Communicaion Disorders, Dallas, Texas; Maryland School for the Deaf, Frederick, Maryland (Added in 1972); Minneapolis Public School System, Minneapolis, Minnesota; New Mexico School for the Deaf, Albuquerque and Santa Fe, New Mexico; Rochester School for the Deaf, Rochester, New York; St. Paul Public School System, St. Paul, Minnesota; The Bill Wilkerson Hearing and Speech Center, Nashville, Tennessee (Withdrew in 1971).

receives input through speechreading, amplification, signs and fingerspelling. A proficient teacher will sign in coordination with the spoken word, using fingerspelling to illustrate elements of language for which no signs exist.

Program administrators were not obligated to maintain any particular aspect of their program for the duration of the research. They were simply requested to continue to provide what they considered to be the most effective program possible for hearing impaired children. This has presented some difficulty in classification because some programs have been in transition from one method or philosophy to another. However, it does enable the investigators to assess the effects of change, e.g., from an Oral to a Total Communication program or from an unstructured to structured format at different age levels.

Table 3 summarizes the methodological approaches employed in the various programs during the evaluation. The reader will note that some programs have been classified as transitional. This classification indicates that while a new methodology had been implemented in the program teachers and staff were in the process of developing their proficiency in the use of the newly adopted approach.

Two oral-aural programs had incorporated total communication components in their educational structure to provide an additional manual supplement to these students diagnosed as requiring such. These programs are indicated in Table 3 by the notation Oral (TC).

In the program employing the individualized approach, students were instructed in either the total communication or oral approach as decided by the staff.

Table 3

Methodologies Employed by Programs During the 5-Year Evaluation

Program	Years 1970-71	 1971-72	 1972-73	 1973-74
Program A	Oral	Transitional (TC)	TC	TC
Program B	Oral	Oral	Oral (TC)	Transitional TC
Program C	-	TC	TC	TC
Program D	Oral	Oral	Oral (TC)	Oral (TC)
Program E	TC	TC	TC	TC
Program F	Transitional (Rochester)	Rochester	Rochester	Rochester
Program G	Rochester	Individualized (TC - Oral)	Individualized (TC - Oral)	Individualized (TC - Oral)

Selection of Subjects

Of the total sample population (N = 102) complete data was obtained for 60 children who comprised the four-year longitudinal sample. These subjects have satisfied the following requirements:

1. Birthdate between March 1, 1966 and March 1, 1968;
2. Sensori-neural hearing loss of 70 dB or greater in the better ear across the speech range;
3. Leiter International Performance Scale IQ of 80 or better;
4. Age of onset of hearing loss of two years or younger;
5. No other severe handicap in addition to the hearing loss.

The primary source of pupil information has been cumulative record files. In the spring of 1974 the files were reviewed and information regarding most recent audiometric data and official confirmation of etiology and age of onset was gathered. 1974 was the first year that quantitative audiograms have been available for all children in the sample. Complete data has been gathered on the children for four years in all of the programs except for 8 subjects from the program which entered the study in September, 1971.

Description of Subjects

The chronological ages of the 60 subjects at the time of the 1974 testing period ranged from 74-97 months, with a mean age of 84.95 months. The IQ measure employed at the onset of this project was the Leiter International Performance Scale. Because it reaches lower chronological age levels than other scales, and tests the ability to learn rather than acquired skills already learned, it was deemed an appropriate criterion measure.

In keeping with the guidelines of the original research proposal for this investigation an additional measure of intellectual functioning, the WISC Performance Scale, was administered to the entire sample population in the fall of 1974. Table 4 summarizes by program the mean scaled scores for each of the WISC Performance Scale subtests as well as the mean Performance IQ scores and the Leiter IQ scores. For the WISC, scaled subtest scores are derivations of raw scores such that at each age and for each subtest the mean scaled score for the standardization sample is 10 with a standard deviation of 3.

The mean Performance IQ for the 60 children in this year's sample was 110.17 for the WISC and 116.57 for the Leiter Scale. WISC scaled subtest scores ranged from 13.63 (Picture Completion) to 10.00 (Picture Arrangement) with intermediate scores at 10.07 (Copying), 11.92 (Block Design) and 12.02 (Object Assembly). Figure 1 illustrates the patterning of the subtest scores of the deaf sample as compared with hearing norms, and is perhaps indicative of a unique cognitive style in this deaf population.

For the 60 children in the longitudinal sample, comparisons of the 1974 WISC Performance IQ scores and the Leiter Performance IQ scores obtained four years ago reveal a decrease of approximately 6.4 points. This decrease in IQ scores across time is consistent with the findings of Quigley (1969) who reported a difference of 12 points between the Leiter Scale mean score and average scores from the WISC Performance Scale administered four years later.

Despite these findings, a significant Pearson product-moment

Table 4

Performance Scaled Scores by Subtest and Program

Program	N	Picture Completion	Picture Arrangement	Block Design	Object Assembly	Copying	Total WISC Performance IQ	Mean Leiter IQ
Program A	6	12.50	8.67	11.83	8.67	11.17	103.33	114.17
Program B	12	14.83	10.00	12.58	13.33	9.67	113.58	124.33
Program C	8	12.13	9.75	11.63	11.38	9.50	104.38	112.54
Program D	13	12.85	9.54	11.69	12.92	10.38	110.38	107.25
Program E	8	13.75	10.75	12.75	12.38	10.13	113.50	132.00
Program F	8	14.38	10.13	11.06	12.25	8.25	108.50	104.00
Program G	6	14.83	11.17	11.83	10.83	11.83	114.50	123.33
Total Mean Scores	60	13.62	9.85	11.93	12.02	10.03	110.09	116.57

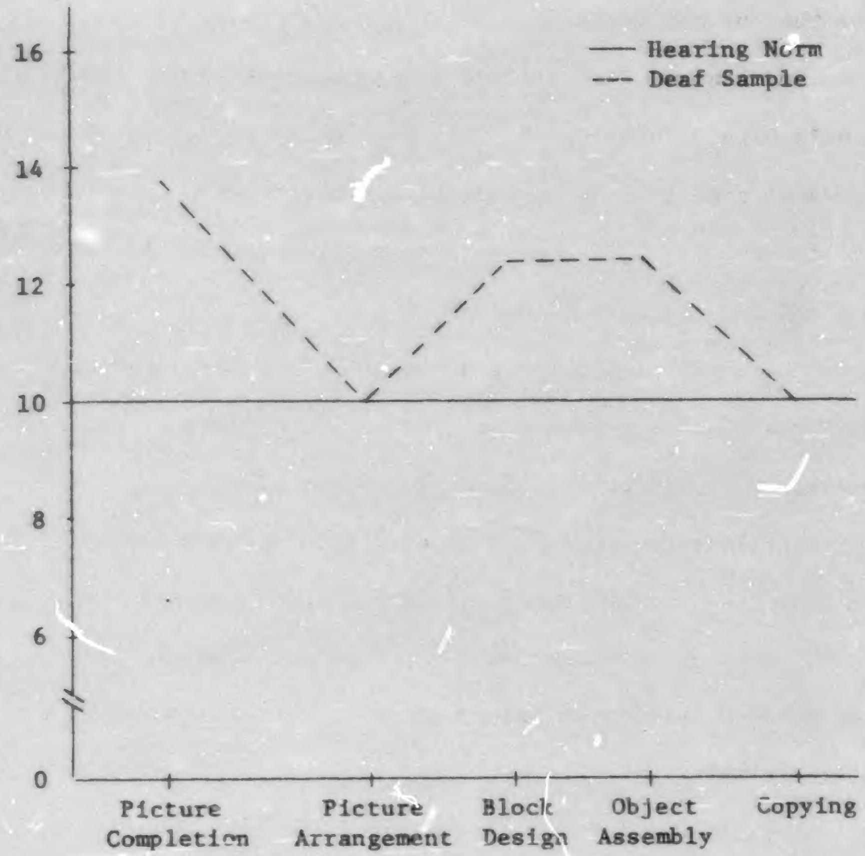

Figure 1. Mean WISC Performance Scaled Scores by Subtest

correlation of .54 ($p < .001$) between the two test scores was obtained for the current inquiry.

Audiometric data yielded a mean hearing loss of 98.50 for the sample with a range of 75 - 110 dB. As in 1973, 92% of the sample had some type of hearing aid, either their own or one loaned to them by the school. This contrasts to a figure of 85% in the 1970-71 period and 88% for the 1971-72 period.

A summary of sex, age, and hearing loss by program is available in Table 5. The t-test comparisons on the basis of these factors reveal no significant difference between programs.

The breakdown of the sample by etiology and age of onset of hearing loss may be found in Tables 6 and 7 respectively. Despite recent medical and diagnostic advances it is interesting to note that the Unknown Etiology category is the largest, accounting for over 1/3 of the sample.

Data in the pupils' cumulative files indicate that by June 1974 8 children had attended their present program for three academic years. For the other six programs, 23 children had been enrolled for four years, 23 for four to five years, and 6 for five or more years.

Eighteen pupils are currently living in residential schools; the remaining children attend day classes either in public schools, residential schools or speech and hearing centers. The number of class hours of instruction varies from program to program and also within some programs. However, almost all of the children are now

Table 5

Subjects Tested in 1974 by Chronological Age, Sex and Hearing Loss

Program	Number of Subjects	Sex		CA Means in Months	Hearing Loss	
		M	F		Mean	Range
Program A	6	5	1	83.17	97.67	90-103
Program B	12	8	4	82.83	95.83	75-108
Program C	8	5	3	87.88	103.50	78-110
Program D	13	11	2	83.69	96.08	83-110
Program E	7	2	5	84.571	101.12	90-110
Program F	8	3	5	39.25	102.00	85-110
Program G	6	3	3	84.50	93.67	75-110
Totals	60	37	23	85.16	98.55	75-110

Table 6

Etiological Diagnoses by Program

Program	Heredity	Illness	Meningitis	Prematurity	Rh Factor	Maternal Rubella	Trauma at Birth	Unknown	Program Total
Program A	4	0	1	0	0	0	0	1	6
Program B	1	0	0	0	0	5	0	6	12
Program C	4	0	1	0	0	1	1	1	8
Program D	1	0	1	1	0	5	0	5	13
Program E	1	1	1	1	0	0	0	3	7
Program F	2	2	1	0	0	0	0	3	8
Program G	0	0	2	1	1	0	0	2	6
Totals	13	3	7	3	1	11	1	21	60

Table 7

Age of Onset by Program

Program	Present at Birth	Birth to 12 Months	12 Months to 24 Months	Unknown	Program Total
Program A	4	1	0	1	6
Program B	10	0	0	2	12
Program C	7	1	0	0	8
Program D	11	0	1	1	13
Program E	3	0	2	2	7
Program F	2	2	0	4	8
Program G	3	0	2	1	6
Total	40	4	5	11	60

judged old enough to attend full day sessions. The average number of hours spent in the classroom for the entire sample is approximately 27.5 per week, an increase over past years. The type of student (residential, etc.) and number of instruction hours by programs is presented in Table 2.

Chapter 3

RESULTS

Illinois Test of Psycholinguistic Abilities

To furnish information with implications for language and cognition and to provide a better understanding of the relationship between deafness and intellectual development, the Illinois Test of Psycholinguistic Abilities (ITPA) was employed in this study. The model of the ITPA (Kirk, McCarthy & Kirk, 1969; Paraskevopoulos & Kirk, 1969) is three dimensional and contains (1) the channels of communication, including auditory and visual input and verbal (vocal) and motor responses; (2) psycholinguistic processes, including reception, association and expression; and (3) levels of organization, including the automatic and representational levels. For the purposes of this study, only the following five visual-motor subtests of the ITPA were administered to the sample population:

1) Visual Reception - measures the child's ability to gain meaning from visual symbols.
2) Visual Association - measures the child's ability to relate visually presented concepts.
3) Manual Expression - measures the child's ability to convey ideas manually.
4) Visual Closure - measures the child's ability to identify a familiar object from an incomplete pictoral presentation.
5) Visual Sequential Memory - measures the child's ability to replicate from memory sequences of nonmeaningful geometric figures.

It should be noted that the Manual Expression subtest is not related to any arbitrary system of manual communication utilized by deaf individuals. Rather, it involves the demonstration of appropriate actions, such as dialing a telephone or playing a guitar, when presented with visual stimulation.

Although all five subtests rely on the visual-motor channel, as previously noted, instructions were designed by the ITPA authors to be presented orally. Thus, additional instructional materials were devised to further assist the child in understanding the tasks when necessary. Instructions for all subtests were given in the mode of communication consistent with the methodology employed by each school.

In the standardization process, approximately 15% of the ITPA sample included children who were found to be nontestable. Similarly, each subject in the present study was eligible to receive a score regardless of refusal to participate or failure to obtain a basal on a particular subtest.

Major Results Cited in Previous Project Reports

In 1971, on modifications of five visual-motor subtests of the ITPA, the subjects as a group scored slightly below the norm for hearing children. Regardless of program, methodology or etiology, a definite pattern of scoring occurred across subtests. The subjects were above the hearing norms on Visual Sequential Memory and Manual Expression and below on Visual Reception and Visual Association. Visual Closure subtest scores revealed a substantial retardation, perhaps due to the timed nature of the test.

While no significant differences (defined as $p < .01$) were found between Combined (oral-manual) and Oral programs on the ITPA, analysis of total scores by program revealed significant differences among programs. Children in structured programs scored higher than those in unstructured programs. When grouped by etiology, children with hereditary deafness were superior to other classifications (Moores & McIntyre, 1971).

An overall regression toward the hearing mean was noted from 1972 to 1974; there were no significant differences on the basis of program, methodology, or etiology subsequent to the 1971 test period. Scores on the ITPA continued to be influenced by the amount of structure in a program with children in more structured programs scoring higher. However, children in less structured programs continued to score within the normal range.

Results

The basic data consists of scaled scores for 60 children on five ITPA subtests for the years 1971, 1972, 1973 and 1974. Scaled scores are transformed raw scores such that at each age and for each subtest the mean or average performance of the standardization sample is 36, with a standard deviation of six. Scaled scores account for both group means and variances and provide a comparison of the child's performance. Table 8 summarizes subtest and total scores for the sample from 1971-1974. The total scores across the four-year period are almost identical to the hearing mean of 180.

Table 8

Longitudinal Sample ITPA Scores by Year

Year	N	Visual Reception	Visual Memory	Visual Association	Visual Closure	Manual Expression	Total Score
1971	48	36.46	40.73	32.91	30.50	38.68	179.21
1972	56	36.28	37.95	34.59	34.12	41.00	183.95
1973	59	34.32	36.32	35.00	33.44	39.88	178.90
1974	60	35.16	36.76	34.48	34.31	40.50	180.65
Mean Scores		35.56	37.94	34.25	33.09	40.02	180.68

In 1971, inspection of the scores of the deaf subjects across the five visual-motor subtests revealed a differential pattern of functioning for the deaf subjects as compared to their hearing counterparts. This pattern remained consistent for the 1972 data although scores on the Visual Reception, Visual Sequential Memory, Visual Association, and Visual Closure subtests regressed toward the hearing mean of 36. Further regression was noted in the 1973 and 1974 test results. Figure 2 presents comparisons of ITPA scores by subtest for 1971, 1972, 1973 and 1974.

From 1973 to 1974 the overall mean scores for subtests have varied less than one full point. With the exception of the Manual Expression subtest, the same scores have stabilized within two mean points of the hearing norm as follows: Visual Reception (35.16); Visual Sequential Memory (37.76); Visual Association (34.48); Visual Closure (34.41). As noted, deaf subjects have continued to maintain relatively higher scores on the Manual Expression subtests (40.50). The sample score for this subtest differs significantly from the hearing mean ($\underline{t} = 6.5189$; $\underline{p} < .001$).

These data lend further support to the results of the previous two years, i.e., that subjects in the present sample function normally in the visual-motor channel.

Correlations

Table 9 presents intercorrelations for the five subtests by year. Significant correlations ($\underline{p} < .01$) were found for all ten comparisons in 1971. While significant differences existed for the

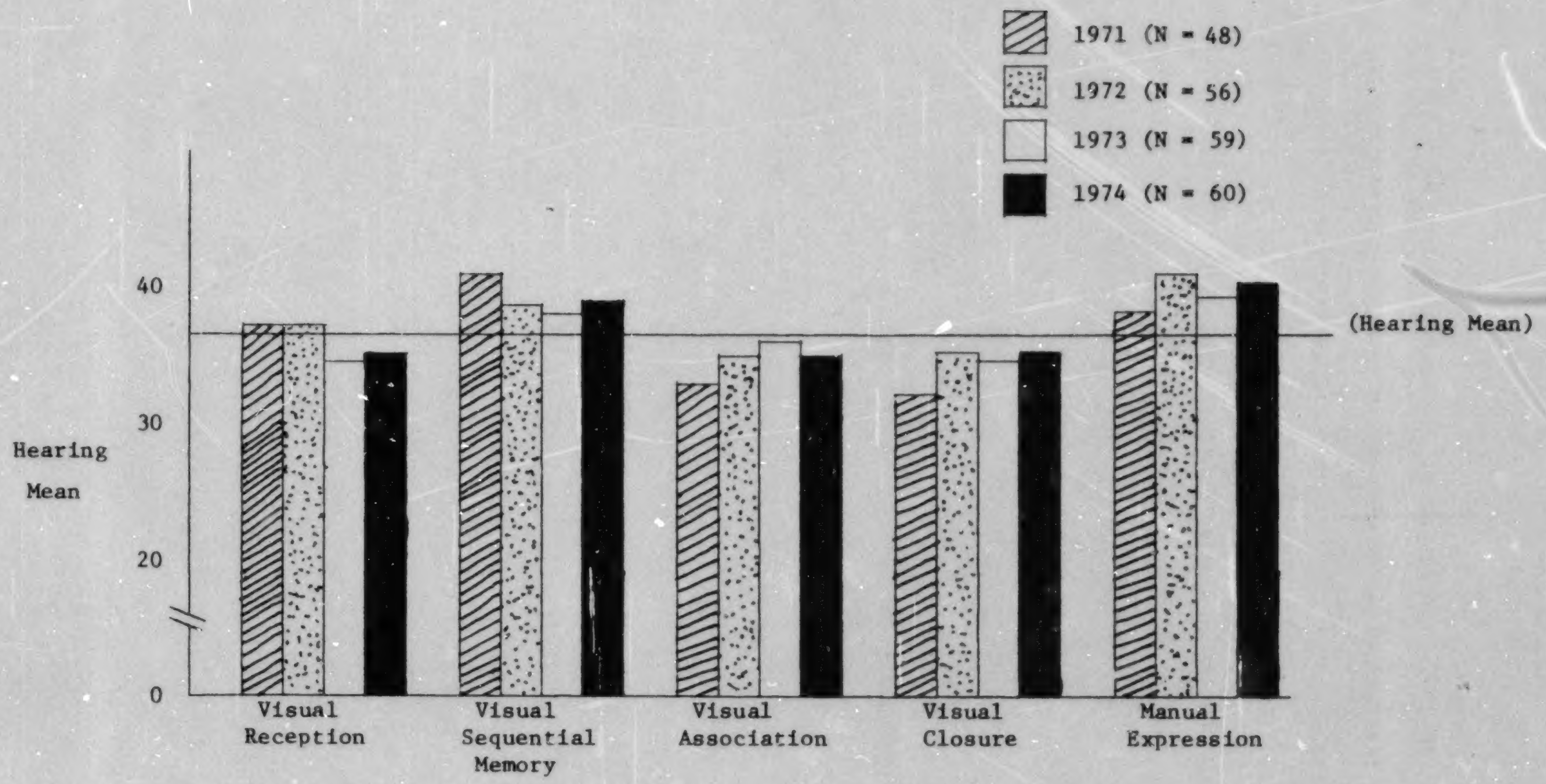

Figure 2: ITPA Subtest Scores by Year

Table 9

ITPA Intercorrelations by Year

	VR	VSM	VA	VC	ME	TOT
	1971 1972 1973 1974	1971 1972 1973 1974	1971 1972 1973 1974	1971 1972 1973 1974	1971 1972 1973 1974	1971 1972 1973 1974
VISUAL RECEPT.	1971					
	1972					
	1973					
	1974					
VISUAL SEQ. MEM.	1971	.62**				
	1972	.14				
	1973	.09				
	1974	.17				
VISUAL ASSOC.	1971	.59**	.55**			
	1972	.32*	.28			
	1973	.48**	.23			
	1974	.35*	.41**			
VISUAL CLOSURE	1971	.66**	.63**	.57**		
	1972	.23	.36*	.29		
	1973	.23	.36*	.35*		
	1974	.39*	.28	.30*		
MANUAL EXPRESS.	1971	.34*	.36*	.39*	.40*	
	1972	.52**	.37*	.59**	.39*	
	1973	.17	.01	.27	.23	
	1974	.38*	.21	.21	.48**	
TOTAL SCORE	1971	.81**	.81**	.80**	.84**	.63**
	1972	.58**	.66**	.73**	.70**	.43**
	1973	.63**	.54**	.75**	.73**	.46**
	1974	.65**	.67**	.66**	.71**	.65**

*p < .01
**p < .001

years 1972 through 1974, the number of differences were fewer than obtained in 197[illegible]. In 1972 the following six significant correlations were: 1) Visual Association with Visual Reception; 2) Visual Closure with Visual Sequential Memory; 3) Visual Reception with Manual Expression; 4) Visual Sequential Memory with Manual Expression; 5) Visual Association with Manual Expression and 6) Visual Closure with Manual Expression.

In 1973 only three correlations were significant at the .01 level; they are 1) Visual Reception with Visual Association; 2) Visual Sequential Memory with Visual Closure; and 3) Visual Closure with Visual Association.

Again in 1974 the following six significant correlations were obtained: 1) Visual Reception with Visual Association; 2) Visual Reception with Visual Closure; 3) Visual Reception with Manual Expression; 4) Visual Sequential Memory with Visual Association; 5) Visual Association with Visual Closure; 6) Visual Closure with Manual Expression. All subtests were correlated at the $p < .001$ level with the total ITPA score.

Academic Achievement

In contrast to the program emphasis during the earlier stages of this preschool evaluation, the program focus of the participating schools during the latter half of the study was characterized by more scholastic and academically centered curricula. In an effort to assess the educational development of the subjects, the Metropolitan Readiness Tests (MRT) and the Metropolitan Achievement Tests (MAT-Primer Battery) were selected for inclusion in the evaluation. According to their authors, the development of the tests was based on extensive analysis of current materials, syllabi, state guidelines and various curricular sources. Selection of these measures for this study was based on appropriateness of content and format, and clarity of wording. Instructions were provided in the mode of communication consistent with the methodologies employed in the various programs. When necessary, adaptations for use with sign language were made.

In the spring of 1973 the assessment of academic achievement was begun using four subtests of the Metropolitan Readiness Tests, Form B (Hildreth, et al., 1965) with children 5.5 years and older. These tests are designed to measure the extent to which children have acquired those abilities which contribute to success in first grade. The basic purpose, then, is to provide teachers with a quick and reliable instrument for assessing individual needs of children entering first grade. The tests are considered primarily as diagnostic tools.

On the basis of pilot testing, the following subtests were administered in the 1973 test battery to the subjects participating in this evaluation:

Matching - attempts to tap visual-perceptual skills analogous to those implemented in discriminating word forms in beginning reading.

Alphabet - is intended to discern the ability to accurately recognize letters of the alphabet.

Numbers - is designed to take account of number concepts skills, ability to manipulate quantitative relationships, recognize and produce number symbols and related knowledge.

Copying - evaluates combined visual-perception and motor control skills similar to those needed in handwriting acquisition.

The Word Meaning and Listening subtests of the MRT were not administered in this investigation because pilot test results suggested that the subjects' reliance on verbal instructions tended to depress scores as a function of the children's inability to understand the tasks. These difficulties were noted in all programs regardless of methodology employed.

The assessment of academic achievement was continued in the spring of 1974 when portions of the Metropolitan Achievement Tests were administered. Prior to data collection a pilot evaluation of the instrument was conducted. Subsequent to this, the following subunits of the MAT (Primer Battery) were selected for use in the study:

Reading - attempts to measure pupils' beginning reading skills through letter identification, picture word and picture sentence association.

Numbers - attempts to measure pupils' understanding of basic computational principles and relationships including counting, measurements, number recognition, addition and subtraction of one digit numbers.

Due to the strong verbal and auditory components in the Listening for Sounds subtest, this unit was not included in the evaluation.

Results of Previous Research Reports

Results of the MRT by program indicated that the overall sample mean and the average scores for six of the seven programs exceeded the average score for the standardization sample, thus suggesting essentially normal functioning on the four readiness measures. Since *t*-test comparisons showed significant differences among programs it appears that, for some programs at least, preschool experiences have prepared deaf children in skill areas which contribute to readiness for first grade instruction. However, by 1974, *t*-test comparisons revealed no significant differences by program for either subtest or total scores.

Results - Metropolitan Readiness Tests (MRT)

The four Metropolitan Readiness Tests were administered to 57 children in the longitudinal sample. The overall mean for the four tests was 40.32; the mean sum of the four tests for the population of hearing children on which the test was standardized was 35.72, somewhat lower than that obtained by the longitudinal sample. Scores by subtest for the longitudinal sample are as follows: Matching--9.57; Alphabet--12.95; Numbers--9.47; Copying--8.49.

In their discussion of the standardization of the MRT, Hildreth, et al. (1969) do not provide ages of the standardization subjects. The sample consisted of over 6,500 beginning first grade students (p. 15), and so a chronological age of somewhat greater than 6.0 seems reasonable, thus making the mean age of the standardization sample similar to those participating in the present study at the time of testing.

Examination of the performance of the 57 children in the longitudinal sample on the individual tests reveals a difference in scores from that of the standardization sample. The sample of deaf children scored significantly higher: Matching (p < .001) and Alphabet (p < .001). While their performance on the Numbers tests was significantly lower than that of the standardization sample (Table 10). The relatively poor performance on the Numbers test may be due in part to the fact that all questions were presented verbally. Scores for the deaf subjects on the Copying subtest were also significantly higher than those of the standardization population. In all schools, including those where signs and fingerspelling were added to the verbal presentation, it is possible that the results were confounded by the receptive communication abilities of the children.

Table 10

Metropolitan Readiness Tests Significant t-test Comparisons Between Sample Mean and Population Mean by Tests

Test	Sample Mean	Standardization Population Mean	t	df
Matching	9.57	7.49	5.65**	56
Alphabet	12.95	9.39	6.84**	56
Numbers	9.47	12.02	-5.01**	56
Copying	8.49	6.82	3.43*	56

*$p < .01$
**$p < .001$

Results - Metropolitan Achievement Tests (MAT)

The two subtests of the MAT were administered to the 60 subjects in the present sample. Since the authors of the MAT do not provide age adjusted scaled scores, statistical analyses were computed on the sample's raw scores by subtest. Raw scores for the sample are as follows: Reading--25.85, Numbers--19.95, and Total Score--45.50.

The MAT authors provide percentile rank scores for standardization samples at the end of kindergarten and the middle of first grade. These percentile ranks provide a comparison of the child's position relative to the normative group with the 50th percentile indicating a typical performance. Since the mean chronological age of the current sample is approximately 7 years, the percentile rank for the middle of first grade appears to be the most appropriate for use here.
The present sample of 60 children received a mean percentile rank of 62 on the Reading subtest, a rank slightly above the average performance of hearing first graders, while their mean percentile rank of 35 on the Arithmetic subtest falls below the typical score of the hearing group.

These findings are similar to those of the 1973 Metropolitan Readiness Tests in which the sample of deaf children scored significantly higher on the reading related tests of Matching and Alphabet while their performance on the Numbers test was significantly lower than that of the standardization sample. At that time it was felt that the relatively poor performance on the Numbers test could be attributed to the fact that all questions were presented verbally.

Even in schools where signs and fingerspelling were added to the verbal presentation, there was still a possibility that the results were confounded by the receptive communication abilities of the children.

Although the verbal nature of the Arithmetic subtest may still account in part for the relatively poor performance of the deaf subjects on computational tasks, this second year of data lends further support to indications that perhaps these children are functioning below their hearing counterparts in the area of arithmetic, or that at this point the programs appear to be emphasizing the development of reading rather than computational skills.

As might be expected the correlations between and within the Readiness and Achievement measures (Table 11) were for the most part highly significant. There was only one correlation which did not reach the .01 level of statistical significance, that between the Copying and Alphabet subtests of the Metropolitan Readiness Tests.

Table 11

Academic Achievement Tests

Intra and Intertest Correlations

	M	A	N	C	T	R	N
MRT (1973)							
Matching							
Alphabet	.40*						
Numbers	.38*	.45**					
Copying	.57**	.15	.40*				
Total	.74**	.70**	.78**	.69**			
MAT (1974)							
Reading	.52**	.55**	.49**	.32*	.64**		
Numbers	.48**	.48**	.59**	.57**	.73**	.65**	
Total	.55**	.57**	.60**	.51**	.76**	.89**	.92**

*$p < .01$
**$p < .001$

Communication Battery

In response to the need for empirical tests of the communication skills of young deaf children, three scales were developed to assess receptive, expressive and articulative abilities.

At the time the communication battery was developed, vocabulary for all three scales was selected from lists of words provided by teachers which the children were judged capable of speaking, speechreading, and/or recognizing in print. Each child in the sample, therefore, was evaluated by his or her teacher. Only the 50 words which occurred most frequently across all schools were selected for inclusion in the communication battery vocabulary. Prior to the testing date at each program, the list of 50 words was sent to the school so as to allow the teachers to review or practice any unfamiliar words with the children. This procedure was developed to lessen the chances of any test being one of vocabulary alone rather than one of other communication abilities. In 1972, following field testing, the receptive communication and articulation tests were judged to be at a stage suitable for use in testing situations. The receptive communication measure was modified and expanded to encompass additional items for administration in 1973 and 1974. Validation of the instrument is continuing.

The expressive communication test was not judged to be at a point of development to justify its use as an assessment tool in 1972, and was therefore administered experimentally in 1972 and used in revised form in 1973. The expressive instrument was again administered in 1974 following extensive redesigning and modification.

Receptive Communication Scale

As the children participating in the study have become older it has become necessary to expand this measure to more adequately assess their increasing skills and abilities. Thus, each year the Receptive Communication Scale has been further developed to include additional and more complex grammatical constructions.

The Receptive Communication Scale was developed to assess five different but not mutually exclusive modes of communication: 1) Sound Alone, 2) Sound plus Speechreading, 3) Sound and Speechreading plus Fingerspelling, 4) Sound and Speechreading plus Signs, and 5) the Printed Word. Number 1 is similar to the Auditory Method; number 2 to the Oral Method; number 3 to the Rochester Method and number 4 to Total Communication. The authors did not investigate reception of Speechreading, Fingerspelling or Signs Alone. The object was to test the children under close to normal pedagogical conditions used with the deaf. Those conditions always included the spoken word.

In 1972, 20 items representing four levels of difficulty were developed using the basic vocabulary lists provided by teachers in the programs. At each level 4 items tested the following concepts: numbers, adjective-noun phrases, noun-conjunction-noun phrases and noun-verb-prepositional phrases. For each of the 20 correct items three additional multiple choice foils were constructed. Alternate choices were balanced in matrix form (e.g., picture of a red ball [stimulus item] along with a blue ball, a red top and a blue top [alternate foils]) so that children would have to receive an entire phrase rather than any part of it in order to make a correct response. The position of the correct choice was randomly determined on each page for each of the 20 items. A sample page is found in Appendix A.

The 20 stimuli were randomly assigned to one of five groups, each of which contained one item from every level of difficulty thereby enabling administration of any one of the five groups in any of the five modes of communication. A sample card was constructed to assist and/or train the child before each new mode of communication was introduced. To emphasize the change in mode, the same training card was always used.

The Receptive Scale was expanded in 1973 to include 5 items of noun-verb construction increasing the total number of items to 25. Each of these items was randomly inserted into one of the five groups of items described above. Test administration was consistent with that of 1972.

Receptive Communication Supplement

In 1974, additional items consisting of 5 negative and 5 reversible passive voice forms adapted from Schmitt (1969) were randomized into the existing measure. These items were constructed in such a way that for each passive item the subject and object were reversed in one of the alternate foils (e.g., the boy was hit by the girl [stimulus item], and the boy hit the girl [alternate foil]). For each negative, one of the alternate foils was the positive construction of the same sentence (e.g., the boy is not walking [stimulus item], and the boy is walking [alternate foil]). These additions increased the number of items for each mode of communication from 5 to 7, rendering a total of 35 items.

In assessing comprehension of verb tenses, 15 items were developed incorporating vocabulary and tense from Thorndike's Teacher's Word Book. Each of the five series of three pictures was sequenced to include the future, present progressive and past tenses respectively, (e.g., the girl will sit, the girl is sitting, the girl sat) with the test item in each sequence being administered in one of the prescribed modes of communication. As with the receptive communication scale, a demonstration item was employed to assist the child in communication modes.

For the 1971-72 and 1972-73 evaluations, the two oral programs requested that neither sign language nor fingerspelling be used in testing their oral students. With the exception of the children enrolled in total communication classes within these oral programs, these modes were employed with neither group. The request by the Rochester Method program not to employ signs was also honored. Children in oral classes were given three Sound plus Speechreading tests and children in the Rochester Method program received two Sound plus Fingerspelling administrations in place of signs which were ordinarily used in these portions of the measure.

Results of Previous Research Reports

In 1974, examination of the pattern of responses by mode of communication and program revealed a highly complex relationship between methodology and communication effectiveness. For the sound alone subtest, children in Program D at 58% and Program G at 53% scored higher than those in the other five programs, where scores ranged from 34% to 40%. A similar pattern was reported in 1973, when Program G ranked first, Program D second and the other five were clustered at a lower level. The reasons for the consistent superiority in the use of residual hearing by children within these programs are not readily apparent because the programs differ in methodology, philosophy and orientation.

Mode of communication within the classroom does not appear to be a factor since the children in Program G initially received their instruction with the Rochester Method and subsequently were exposed to sign language. All of the children in Program D began with an auditory approach to instruction while a few began receiving instruction via total communication. It therefore appears that this superiority is the result of more intensive auditory training and aural rehabilitation components within these programs.

The addition of speechreading to the Sound Alone portion of this battery most closely approximates day-to-day communication with hearing individuals in that the deaf person directly faces the hearing person and makes use of residual hearing and speechreading simultaneously. In this context, the Sound Alone subtest provides little information on actual interpersonal communication abilities.

Although the overall average score rose from 44% for Sound Alone to 68% for Sound and Speechreading, there is diversity in the amount of improvement from program to program. In terms of efficiency there appear to be three distinct groups. Program G (90%) and Program F (83%) in the higher group; Program D (67%), B (65%), and C (65%) in the medial position; Program A (53%) and Program E (51%) in the lower scoring position. From this, one may conclude that early manual communication does not hinder oral receptive skills since children in the two high scoring programs (Programs G and F) have used manual communication, while Program G children have used it from the beginning of the study and the Program F children for the last two and one half years of the study. Conversely, it is obvious that early manual communication, per se, does not necessarily facilitate oral receptive skills, since children in the two low scoring programs have also used manual communication.

The addition of fingerspelling has presented the greatest variation of scores (46%) among programs. Again, it appears that this variation can be attributed to the length of time that fingerspelling had been employed in the program and to the emphasis on fingerspelling within the program. For example the score of 55% for Program D reflects performance of a small number of children who were exposed to manual communication in the classroom during the last year of the study. Classroom activities in this initial year of instruction consisted of the development of basic sign vocabulary with little emphasis on fingerspelling.

The orientation of Program B has shifted from Oral-Aural to Total Communication within the last year and a half of the study.

The program now utilizes the Seeing Essential English (SEE) system of sign language which minimizes reliance on fingerspelling.

The two programs scoring highest on this portion of the measure, Program G at 97% and Program F at 89%, are the only two programs which have employed the Rochester Method during the evaluation. Although Program G is no longer using the Rochester Method, this approach was employed during the initial year of the evaluation.

As noted previously, the simultaneous use of sound and speechreading and signs is most efficient with an overall score of 88% correct. The three programs which scored highest on this portion of the measure approach the ceiling for the test. Even the children in Program D who had been only recently introduced to sign language scored at 85%. The lowest scores, 83% for Program A and 80% for Program B, remain high relative to other modes.

Summarily, consistent results from 1972, 1973 and 1974 illustrate that comprehension improves with the addition of each dimension. Examination of scores within and between programs suggests a highly complex relationship between methodology and communication. Degree of competency under the various modes of communication appears dependent upon specific training components with the programs, the length of time the modality has been used in the program, and the extent to which an approach has actually been employed. It would therefore appear that specific components within programs seem to facilitate success in a particular mode of communication as opposed to any one methdological approach.

Results

For purposes of analysis the Receptive Communication Scale has been separated into the following four sections:

1. Core Items (employed in the 1972, 1973 and 1974 evaluation): 25 items consisting of 5 number, 5 adjective-noun, 5 noun-verb, 5 noun-conjunction-noun, and 5 noun-verb-prepositional phrase constructions.
2. Negatives (employed only in the 1974 evaluation): 5 supplemental negative constructions added to the revised 1974 communication scale.
3. Passives (employed only in the 1974 evaluation): 5 reversible passive items added to the revised 1974 communication scale.
4. Verb Tenses (employed only in the 1974 evaluation): 15 verb items comprised of the future, present and past tenses added to the revised 1974 communication scale.

Core Items

The basic data consisted of the percent correct for each mode as well as the total percent correct on all 25 items for each subject. Table 10 presents the average scores by mode and program. Arcsin transformations (Winer, 1962) were applied to the data before the statistical analysis to minimize difficulties inherent in the use of proportional data.

Examination of Table 12 illustrates a consistency in results from 1972 and 1973 to 1974 as scores improved with the addition of

Table 12

Longitudinal Sample Receptive Communication

Scale (Core) by Year: Percent Correct

Year	N	Printed Word	Sound Alone	Speech-reading	Finger-spelling	Sign Language	Total Score
1972	57	39	36	57	64	77	53
1973	59	53	42	63	69	80	60
1974	60	76	44	68	75	88	69

each component. Because they do not involve direct person to person communication, Printed Word scores were considered separately.

The scores for the Printed Word subtest illustrate the greatest gains by mode of communication across the three-year period from 1972 - 1974 with scores increasing from 39% correct in 1972 to 53% in 1973 and 76% in 1974.

The remaining four modes of communication scores improve from Sound Alone to Sound plus Speechreading, to Sound and Speechreading plus Fingerspelling, to Sound and Speechreading plus Signs. The overall accuracy for the years 1972, 1973 and 1974 is 53% to 60% and 69% respectively. Despite continued improvement in the children's receptive communication skills, the hierarchy of difficulty for these four modes of communication has remained constant across the three-year period.

Each year the four person-to-person modes of communication were examined to determine if statistically significant differences among modes existed. For the three years from 1972 to 1974, analysis by $\underline{t}$ test indicates that Sign Language, Fingerspelling and Speechreading were significantly easier (larger percentage correct) than Sound Alone, while Sign Language was also significantly easier than Speechreading. In 1973 and 1974 scores for the Sign Language subtest were significantly higher than those of the Fingerspelling subtest (Table 13).

Since all person-to-person modes of communication involved some degree of auditory input, it was decided to analyze the results of

Table 13

Receptive Communication Scale (Core Items): Significant Comparisons between Person-to-Person Modes of Communication

Comparison	Year	t	df
Sign Language > Fingerspelling	1973	2.69*	60
	1974	2.70*	86
Sign Language > Speechreading	1972	2.76*	79
	1973	4.07**	83
	1974	3.88**	98
Sign Language > Sound Alone	1972	6.36**	79
	1973	7.88**	83
	1974	9.05**	98
Fingerspelling > Sound Alone	1972	5.16**	87
	1973	4.95**	91
	1974	5.12**	106
Speechreading > Sound Alone	1972	4.64**	112
	1973	4.62**	116
	1974	4.14**	118

*p < .01

**p < .001

the communication scale by hearing loss to determine its relationship to communication ability by mode and total score.

Degree of hearing loss was not highly correlated with scores on the Printed Word, Fingerspelling or Sign Language for the years 1972-74 while the scores for Sound Alone and Speechreading indicate a significant relationship with hearing acuity. Correlation coefficients were statistically significant for Sound Alone in 1972 and 1974 and for Speechreading in 1972, 1973 and 1974. Although hearing loss correlated significantly with total receptive communication scores for 1972 and 1974, a level of statistical significance was not reached for 1973 (Table 14).

Pearson product-moment correlations between modes of communication for the years 1972 and 1973 reveal one significant relationship ($\underline{p} < .01$), that of Fingerspelling to Speechreading ($\underline{r} = .58$, $\underline{p} < .001$). However, in 1974 seven of the 10 possible correlations reached the .01 level of significance. They are summarized as follows:

Speechreading with the Printed Word ($\underline{r} = .32$)
Speechreading with Sound Alone ($\underline{r} = .47$)
Fingerspelling with the Printed Word ($\underline{r} = .49$)
Fingerspelling with Sound Alone ($\underline{r} = .37$)
Fingerspelling with Speechreading ($\underline{r} = .50$)
Fingerspelling with Sign Language ($\underline{r} = .60$)
Sign Language with the Printed Word ($\underline{r} = .52$)

For each year, all correlations between total scores and modes of communication were significant (Table 15).

Negatives

In the examination of the negative items of the receptive scale, both the percentages of correct responses and positive interpreta-

Table 14

Correlation between Hearing Loss and Receptive Communication Scale Scores (Core Items) by Mode of Communication

	1972	1973	1974
Printed Word	.03	.14	-.03
Sound Alone	-.31*	-.18	-.50**
Speechreading	-.40**	-.44**	-.46**
Fingerspelling	-.14	-.15	-.30
Sign Language	.09	.02	.09
Total Score	-.45**	-.27	-.36*

*p < .01

**p < .001

Table 15

Receptive Communication
(Core Items)

		PW 1972 1973 1974	SA 1972 1973 1974	SR 1972 1973 1974	FS 1972 1973 1974	SL 1972 1973 1974
PRINTED WORD	1972					
	1973					
	1974					
SOUND ALONE	1972	-.04				
	1973	-.16				
	1974	.08				
SPEECHREADING	1972	.12	.11			
	1973	.29	.20			
	1974	.32*	.47**			
FINGERSPELLING	1972	.39	.32	.34		
	1973	.18	.24	.58**		
	1974	.49**	.37*	.50**		
SIGN LANGUAGE	1972	.09	.11	.01	.37*	
	1973	.16	.33	.34	.38	
	1974	.52**	.17	.24	.60**	
TOTAL SCORE	1972	.43**	.45**	.71**	.80**	.54*
	1973	.56**	.39**	.78**	.68**	.61**
	1974	.56**	.58**	.74**	.80**	.64**

*p < .01

**p < .001

tions of the negative phrase (e.g., picture selection of "the boy is walking," rather than "the boy is not walking") were considered.

The overall percentage of correct responses was 36% with subjects choosing the incorrect, positive interpretation of the negative 46% of the time (Table 16). Thus, the deaf subjects tended to ignore the negative cues and select the picture representing the opposite meaning more frequently than the correct response.

Inspection of the negative scores by mode of communication reveals that the deaf children received a higher percentage of correct responses when items were presented via the Printed Word (45%) than when presented by other modes of communication. Sign Language (38%) and Speechreading (34%) were the next most efficient modes, while Sound Alone (32%) and Fingerspelling (30%) were the least effective means of conveying negative phrases. However, there were no significant differences between modes of communication.

The total negative scores were significantly correlated ($r = .38$, $p < .01$) with the total 1974 Receptive Communication Scores.

Passives

Evaluation of the five passive additions to the Receptive Scale includes both percentages of correct responses and the incorrect reversals of passive phrases (e.g., picture selection of "the girl hit the boy," rather than "the girl was hit by the boy"). There was a total of 300 passive items for the 60 children.

The overall percentage of correct responses was 29% with subjects choosing the reverse interpretation of the passive phrases 47%

of the time (Table 16). It therefore appears that deaf subjects frequently employ the active interpretation of passive phrases, and ignore the passive marker "by."

In separate investigations of deaf children's acquisition of the passive voice, both Power (1971) and Schmitt (1969) observed deaf children between the ages of 8 and 18 making similar types of errors in the comprehension of passives. They suggest that this incorrect interpretation occurs because of the student's failure to reverse the subject-object order of passive sentences. Thus the deaf child not only fails to interpret passive sentences but frequently derives information which is the opposite of that which is intended.

Examination of the passive scores by mode of communication indicates that deaf children received a considerably higher percentage of correct responses when items were presented using the Printed Word (50% correct). Scores for the remaining modes of communication cluster around chance level of 25%, with Sign Language at 28%, Fingerspelling at 25%, Speechreading at 24%, and Sound Alone at 22% (Table 16). Analysis by t test indicated that the Printed Word was significantly more efficient than Sound Alone (t=3.5686, $p < .001$), Speechreading (t=2.8427, $p < .017$) and Fingerspelling (E=2.7462, $p < .001$). The comparison of Sign Language and the Printed Word did not reach a level of statistical significance. Total passive scores were not significantly correlated with the total Receptive Communication Scale Scores (r = .04, N.S.).

Verbs

In the analysis of the 15 verb tense items, the percentage of correct responses by program, mode of communication, and verb tense were considered.

The total percent correct for all 60 children across the 15 items was 39%. It appears that the Printed Word, 42% correct, was the most effective means of presenting the verb tense items to this group of children. Scores of the remaining four modes of communication are relatively close with Sound Alone and Fingerspelling at 38% correct, Speechreading at 37% correct and Sign Language at 34% correct (Table 16). However, there were no significant differences by mode of communication.

By verb tense, the children recognized the present progressive tense most frequently (59%), followed by the past tense (41%) and the future tense (17%). However, these findings are confounded by the fact that the subjects had a tendency to select most often the pictures in the medial position which depicted the present progressive tense. Disregarding the correct responses, subjects chose the pictures in the initial position 14%, the medial position 56%, and the final position 30% of the time.

Total verb tense scores were not significantly correlated with total Receptive Communication Scale Scores (r = .20, N.S.).

Table 16

Receptive Communication Scale (Negatives, Passives and Verb Tense):

Percent Correct by Program

Subtest	N	Printed Word	Sound Alone	Speech-reading	Finger-spelling	Sign-language	Total
Negatives	60	45	32	34	30	38	36
Passives	60	50	22	24	25	28	29
Verb Tense	60	42	38	37	38	34	39
Means by Mode	60	45.67	30.67	31.67	31.00	33.33	34.67

Expressive Communication Scale

In addition to the articulation portion of the battery, a communication scale was developed to assess expressive language abilities. In 1973, stimuli for the expressive scale consisted of twenty-five pictures selected from the alternate foils of the receptive communication scale representing five levels of linguistic difficulty: number concepts, adjective-noun phrases, noun-conjunction-noun phrases, noun-verb, and noun-verb-prepositional phrase constructions.

It was felt that the simplicity of the stimulus items tended largely to elicit naming responses rather than allowing for a more connected narrative description. Therefore, in the 1974 evaluation eight sequenced picture stories, each consisting of four to five pictures selected from the Developmental Learning Material (DLM) Sequential Cards, were used as stimulus items. On the basis of pilot testing, it was found that these more complex stimuli provided a greater opportunity to use connected language in the expressive attempts.

In an effort to stimulate descriptive communication, a pretest training period was conducted during which questions were directed to the subjects concerning the content and meaning of the demonstration sequenced item. The eight sequenced picture stories were then presented in random order; each subject was encouraged to relay a story about the picture series. The children were free to say as much or as little about each picture as they chose, and to use the mode(s) of communication of their preference.

Sessions were video taped for later review during which three groups of raters were employed to observe the video tapes. To account for differences in communication approaches and skills, these selected groups were comprised of eight Interpreters, eight Deaf Adults, and eight Graduate Students in Education who were unfamiliar with manual communication. All twenty-four raters were instructed to write what they thought each child was communicating; those raters who were naive in manual communication and those Deaf Adults viewing oral communication were encouraged to abstract as much information from the video tapes as possible. The tapes were later reviewed and transcribed via collaboration of an interpreter and teacher of the deaf, both proficient in the use of sign language and fingerspelling.

For purposes of the present report, analysis of the tapes will be limited to a discussion of intelligibility and preferred mode of communication. A more detailed analysis of the quality and type of grammatical constructions employed by the children will be published in a supplementary report. While substantial revisions in the 1974 test format have been made, the expressive communication scale is still considered to be in an experimental stage. Work is continuing to further develop this measure in content and format.

Results

The 1973 experimental version of the expressive communication scale assessed comprehension of expressive attempts as a function of the hearing status of raters. Results revealed that:

a) Raters correctly identified 37% of the expressive attempts.

b) By groups, Interpreters achieved 56.66% correct, while Deaf Adults and hearing Graduate Students achieved 32.21% and 19.54% respectively.

c) Scores for individual children ranged from 8% to 57%.

In 1974, the mean number of units of expression (any sign, gesture, or fingerspelled word used independently or in conjunction with the spoken word) for each individual taping session was 143.3 with a range of 38-415 units. The basic data consisted of the percentage of words correctly identified by all twenty-four raters for each child.

There are a total of 56 subjects in the current analysis. Due to mechanical failure and distortion of the audio and visual portion of the tape the expressive attempts for four subjects at one program were rendered difficult to interpret. Consequently, these subjects were omitted from the analyses. At the request of this program, all 8 children in the sample were retaped in the spring of 1975. Because of the subjects' previous exposure to the stimulus items, their increased chronological age (most of the subjects were then between the ages of 8 and 9 years) and the impossibility of assembling the identical group of raters, no comparative analyses were conducted using the 1975 data.

Raters correctly identified 32% of the expressive attempts for the 56 children. By groups, Interpreters achieved 46% correct, while the Deaf Adults and Graduate Students achieved 31% and 20% correct respectively. Percent correct for individual children ranged from 8% to 57%.

The following criteria for identification of a subject's preferred mode of communication were developed:

1. Total Communication - 70% of all units of expression conveyed via simultaneous verbalization and signing or fingerspelling.
2. Rochester Method - 70% of all units of expression conveyed via simultaneous verbalization and fingerspelling.
3. Sign - 70% of all units of expression conveyed via signs. Signs were not consistently accompanied by spoken words.
4. Fingerspelling - 70% of all units of expression conveyed via fingerspelling. Fingerspelling was not consistently accompanied by spoken words.
5. Gesture - 70% of all units of expression conveyed via gestures.
6. Manual - 70% of all units of expression conveyed via gestures, signs or fingerspelling which were not necessarily accompanied by verbalization.
7. Oral - 70% of all units of expression conveyed via verbalization only.

Only one child did not meet any of the above criteria. His expressive attempts were illustrated through the use of either gestures or verbalization, neither of which were sufficient to reach the 70% criterion level.

The most frequently employed mode of communication was total communication (N = 18), followed by oral communication (N = 17) and signs (N = 14). One child employed the Rochester approach while five used a manual approach to convey information. In the 1975 retaping of subjects whose video tapes were faulty, seven children employed the Rochester Method while one used Total Communication.

Articulation

The articulation portion of the communication battery was comprised of ten one and two syllable words. They were as follows:

apple
bird
cat
dog
eye
top
fish
milk
red
shoe

Each word was presented individually by means of a colored, 5 by 7 inch illustration. Upon presentation the subject was instructed to repeat each word after the examiner until it was determined that his or her best attempt at that word had been audio-recorded. If the examiner was not successful in soliciting a clear reproduction, she again presented the word for a more accurate imitation. Attempts were made to obtain an utterance for each of the ten words.

The complete list of words in the articulation portion of the communication battery was sent to each respective school in advance of the test date to enable teachers to review any unfamiliar words. The test, therefore, was one of the child's ability to articulate words he knew rather than a test of his ability to imitate unfamiliar speech produced by others.

For the years 1972 and 1973 a stereo taping system was employed which necessitated recording the subjects' and examiners' voices on separate channels. Because of the number of words lost in the subsequent editing process an alternate recording method was devised for successive years. To eliminate mechanical complexities and to facilitate the editing process, a Panasonic monaural tape recorder was used in the collection of the articulation data. This modification in the recording procedure facilitated securing ten utterances per subject, the total number prescribed for each child.

To prepare the tapes for judging by raters, each child's best attempt at the ten words was edited and randomized for transfer to another recording unit. In this way responses for children from one program were randomly mixed with children from all other programs. The resulting tapes were then played for two groups of raters, most of whom were unfamiliar with the speech of the deaf.

The first half of the raters heard the tape from beginning to end. To eliminate any order effects, the second half heard the end, middle and beginning of the tape respectively. The raters were presented with a list of 25 words (Appendix B) and instructed to select from this list the words uttered by the subjects. If unable to determine a word, the raters were encouraged to guess. Subjects were introduced by first name and subject number. Their ten utterances were then presented, each utterance followed by a five second pause during which the raters recorded their responses on the forms provided. The same rating procedure as that described above was used in 1972 through 1974.

Major Results of Previous Reports

For the 1972 articulation scores no significant differences were found among programs or methodologies. In 1973 and 1974, children in two programs scored significantly higher than those in the other five programs. They were also higher in the Sound Alone subtest of the Receptive

Communication Scale. Children in these two programs show little similarity in reading achievement, math achievement, overall expressive communication, receptive communication, ITPA scores or methodology (one program is oral-aural and one is combined). The authors have therefore concluded that articulation of isolated words and use of residual hearing relate purely to the emphasis on auditory training and articulation given by a program and are not related to other factors, including the use of manual communication. Despite statistical differences on average scores between programs in articulation, the range of scores within programs is great and each program has children whose attempts to articulate are almost completely unintelligible.

Results

Scores on this measure consist of the percentage of correct identifications by raters for each of the children in the longitudinal sample. Again, to minimize problems inherent in proportional data, arcsin transformations were applied to the data for all statistical analysis. It was hypothesized that there would be a strong relationship between articulation scores and hearing loss. Pearson product-moment correlations of -.43 ($p < .001$) in 1972, -.58 ($p < .001$) in 1973 and -.60 ($p < .001$) in 1974 between articulation scores and hearing loss confirm this hypothesis.

This measure was administered in 1972 as well as in 1973 and 1974. However. the raters were different in the three years and the authors do not believe that a treatment of comparative scores across the three years would provide reliable information. Because of a lack of consistency among raters from year to year and the new audio recording system employed, no statistical, longitudinal comparisons have been made.

Table 17 summarizes total scores for the years 1972, 1973 and 1974 which fluctuated from 35% to 31% to 37% correct respectively. There appears to have been little if any improvement in the children's ability to articulate single words in isolation across the 3 year period.

Table 17

Longitudinal Sample Articulation Scores by Year

Year	N	Percentage of Intelligible Utterance
1972	56	35%
1973	59	31%
1974	60	37%

Cognitive Development Measures

Barbara J. Best[1]

During the 1972-73 Preschool Evaluation several new measures were initiated. These measures were based on a Piagetian model of cognitive development and were readministered during the 1973-74 evaluation. A brief description of the Cognitive Development Measures and the theory generating the measures follows.

During the period between the ages of five and seven, children's thinking matures in several ways. For example, as the child grows older, his thinking tends to become more reversible, less egocentric and more decentrated. Three Piagetian measures, appropriate for children within the range of five to seven, were chosen in order to measure these changes. The correct solution to each task depends upon the maturity of the child's thinking skills, but also draws on different types of experience, and thus a child's performance should be affected by deafness in different ways.

The first task used was a measure of classificatory development in which the children were required to sort certain materials into suggested classes. There were two parts to this task, one involving the sorting of beads, and one involving the sorting of pictures. A correct solution of the beads task required the children to sort the beads on the basis of shape. A correct solution of the picture task required that the children sort the picture cards into classes--

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[1] Dr. Barbara Best, former Research Associate, RD&D Center, developed, analyzed, and authored the Cognitive Development section of this report.

animals, toys, people, household goods.

The second task was a measure of the development of conservation, in this case, conservation of number. The children were first trained to respond to equality or inequality between two groups of blocks. The blocks were then manipulated in several ways, including rotation, adding equal numbers of blocks to each group, expanding one group, dividing one group into three subgroups, and collapsing one group. Children who understood the concept of conservation made judgments of equality between the two groups despite the manipulations.

The third task used was a measure of seriation ability. Children were first given ten sticks, differing from each other in length by 1/2 inch, and were asked to pick out the smallest and the largest sticks from the group. The three smallest sticks were then used to construct an example series for the child who was asked to copy the example. After the child succeeded in constructing the example, he was asked to construct a series using five and then ten of the sticks, and to insert three new sticks into his completed ten-stick series.

These particular measures were chosen because they tap the important changes in cognitive development, as outlined by Piaget, which take place during the years from five to seven. It has also been argued that the child's cognitive development is a more stable measure of a child's intellectual functioning than is an IQ score. Thus, the purpose behind the creation of these measures was an attempt to differentiate the effectiveness of the various programs involved on some measure other than language and academic skills. It is also of interest to determine whether or not there is a relationship between cognitive development and the child's academic achievement.

Results

The three measures of cognitive development were administered to 60 children in the preschool study. The results of each test can be seen in Table 18. The total mean score for all schools combined was 33.0 with a range of 32.2 to 33.8. This compares to a total mean score of 28.74 in the 1972-73 study. All but one program showed progress in their cognitive development during the 1973-74 school year. Again, t tests were run to compare all programs on each measure. No significant differences were found between the programs on any of the measures of cognitive development, suggesting that children in all the programs are proceeding at a similar rate of cognitive development.

It may be of interest to question what relationship exists between a child's level of cognitive development and other measures of his developmental progress. Pearson product-moment correlation coefficients between the cognitive development measures and other measures are presented in Table 19. It can be seen that the measures of cognitive development are positively correlated with all other developmental measures. The total cognitive score is significantly correlated with Receptive Communication, the Numbers subtest of the Metropolitan Achievement Test (MAT), and the Illinois Test of Psycholinguistic Abilities total score. The Seriation and Classification subtests show this same pattern while the Conservation subtest is not significantly correlated with any of the other measures. The reading

Table 18

Cognitive Development Scores by Program

Program	N	Classification $\bar{X}$	Classification sd	Conservation $\bar{X}$	Conservation sd	Seriation $\bar{X}$	Seriation sd	Total $\bar{X}$	Total sd
A	6	6.2	1.6	17.3	3.0	9.8	.8	33.5	3.7
B	12	6.4	1.4	16.5	2.6	9.8	1.8	32.8	4.0
C	8	6.2	1.7	18.2	2.4	8.8	2.1	33.2	5.0
D	13	6.6	.76	16.7	3.6	9.6	1.8	32.8	4.8
E	7	5.8	1.3	16.7	3.3	9.7	2.6	32.2	4.9
F	8	6.2	1.1	17.1	4.2	9.4	2.3	32.8	6.2
G	6	6.5	1.2	17.3	4.2	10.0	1.3	33.8	4.8
Total	60	6.3	1.3	17.2	3.2	9.6	1.8	33.0	4.6

80

Table 19

Pearson product-moment Correlation Coefficients:

Cognitive Development Measures with Other Selected Measures

	Classification Total	Conservation Total	Seriation Total	Cognitive Total
Total Receptive Communication	.340*	.266	.308	.397*
MAT: Reading	.200	.143	.233	.256
MAT: Numbers	.352*	.243	.340*	.399*
ITPA: Total	.503**	.120	.408**	.382*

* $p < .01$
** $p < .001$

subtest of the MAT is not significantly correlated with any of the cognitive measures, suggesting that learning to read may be based on cognitive factors other than those measures in the test of cognitive development used in this study.

The lack of differences between schools on cognitive measures is interesting for two reasons, one theoretical and one practical. Theoretically, these results suggest that differences in academic curriculum do not necessarily affect the cognitive development of children. And, practically, since there were no significant differences on other developmental and achievement measures, academic performance may be more readily attributable to differential programs at the various schools. In other words, while programmatic differences may not effect cognitive development per se, there is evidence that they do effect the child's performance in school.

Matching Familiar Figures Test

The Matching Familiar Figures Test (MFF) is a series of visual discrimination tasks designed to measure reflection-impulsivity. This dimension describes a tendency to consistently display slow or fast decision times in problem solving situations with high response uncertainty. It has been used to predict success or failure in the acquisition of reading skills (Kagan, 1965).

The test is comprised of twelve items, each consisting of a picture of a familiar object (the standard) and six similar alternate choices, one of which is identical to the standard. Each child is instructed to select the identical picture from the six alternate choices and is permitted six trials to select the correct picture. Presentation of the standard and alternates occurs simultaneously with both being exposed for the full duration of the selection process. A sample page of the MFF is presented in Appendix D. A stop watch is used to record time from the initial exposure of stimuli to the first selection; time is recorded to the nearest tenth of a second. The variable scores are the total number of errors and the average response time to the first selection.

Kagan (1965) reports correlations between average time and errors ranging between -.30 to -.60. Stability of the reflection-impulsivity dimension has been noted over a period as long as 20 months.

The MFF has been used by Kagan to identify reflective and impulsive children. Reflective children are those whose response time is above the median, and error score below the median. Those classified as impulsive score above the median on errors and below it on response time.

Results

The test was administered to the sample in the spring of 1973. One child refused to complete the test. A significant Pearson product-moment correlation between average time and errors of -.31 ($p < .01$) was obtained. This is within the range of correlations reported by Kagan. The mean response time across all children was 8.5 seconds per item with a mean error score of 1.66 per item.

Using Kagan's criteria, 22 reflective and 22 impulsive children were identified. These two groups did not differ significantly on the basis of sex, IQ, age, etiology, or program. Since the MFF has been used previously in reading research, t test comparisons were made between the scores of the reflective and impulsive children for those measures designed to evaluate pre-reading or reading skill, i.e., the Copying, Matching and Alphabet portions of the MRT and the Printed Word subtest of the Receptive Communication Scale.

It was hypothesized that the scores of the reflective children for these variables would be superior to those of the impulsive children. Significantly higher scores were achieved on the Matching Test ($t = 4.6098$, $p < .001$), and Copying Test ($t = 3.6596$, $p < .001$). However, scores did not differ significantly on the Alphabet Test or the Printed Word subtest of the MAT.

Similarities between the MFF and the layout and timing of some ITPA subtests suggested the need for further comparisons between the performances of reflective and impulsive children on the five ITPA subtests. Reflective children were found to be significantly superior on only one subtest - Visual Closure ($\underline{t} = 2.7194$, $\underline{p} < .01$).

The three tests (Copying, Matching and Visual Closure) on which the reflective and impulsive children differed significantly are all timed measures. It may therefore be the ability to function well on a timed test rather than superiority of pre-reading or reading skills that differentiate reflective and impulsive children.

Regular Class Subjects

In recent years there has been an increasing trend toward the integration of the atypical child into mainstream education. In the area of deaf education it appears that the mainstreaming effort has often been applied to the child with the greatest potential to succeed, i.e., with articulatory skill and hearing acuity sufficient to support him in the integrative move. Seemingly, this effort has been facilitated by evaluation and preparation for entering the major educational network along with supportive services in speech therapy and auditory training. It was felt that the importance of successfully integrating the hearing impaired child in the regular classroom environment was an issue deserving of further investigation; thus its inclusion in this research effort.

During the four years of the evaluation fourteen of the children in the longitudinal sample and three other children who had moved from their original programs and received unique placement outside of the seven programs participating in this evaluation had been placed in integrated settings. The placement of these seventeen children was as follows:

> Three children participated in a regular first grade class on a full time basis assisted by a teacher of the deaf within the classroom;
>
> Five children participated in regular and hearing impaired kindergartens, each on a half day basis;
>
> Nine other children participated in regular classes within their home districts and received supplemental speech instruction.

In an attempt to identify characteristics of children functioning in regular class settings from those who have remained in classes for the deaf, statistical comparisons were made between these groups in the following areas: academic achievement (MAT), receptive communication, expressive communication, articulation, age and hearing loss. In addition, the distributions of children within the two groups by sex, etiology, age of onset of hearing loss and preferred mode of communication for the expressive communication scale were examined.

The two groups did not differ significantly on the basis of Metropolitan Achievement Test scores, Receptive Communication, Expressive Communication, sex, age, etiology or age of onset of hearing loss. The group of children who were integrated into classes for the hearing had significantly better hearing acuity ($t = 5.0092$, $p < .001$) and achieved significantly higher scores on the articulation measure ($t = 9.0309$, $p < .001$). All integrated children chose oral communication as their preferred mode during expressive communication scale videotaped sessions.

Longitudinal articulation scores of the two groups were further examined in an effort to trace the development of the articulation scores in the integrated group. It was found that in 1972, the first year articulation was measured, the integrated group scored significantly higher than the nonintegrated children ($t = 5.9808$, $p < .001$). This suggests that articulation of the integrated group was superior to that of the children who remained in self-contained situations prior to the integration effort.

Brown Parent Attitude Scale

The disposition and expectations of parents toward social and academic achievement are of great importance to the educational development of children. These attitudes and expectations may significantly affect educational progress and predict success in preschool and beyond. It is therefore of interest in the present study to examine changes which have occurred in parental attitude as their children have become older. Will parents lower their expectations, or raise them? If there are changes, will they be a function of the child's success or failure? What role does the child's program play in the formation and change of parent attitudes?

In an attempt to measure these feelings, A Parental Information and Attitude Scale for Parents of Hearing Impaired Children (Appendix E) was distributed to all parents in the sample for completion and return. Developed by Dr. Donald W. Brown at Gallaudet College, this scale is divided into three parts:

> Part I pertains to general information such as occupation, education, and information about various aspects of the child's hearing impairment.
>
> Part II is entitled, "Your Child Thirty Years From Now." It assesses parental expectations by having parents rate such statements as "will be a college graduate" on a five point scale from "very good chance" to "no chance at all."
>
> Part III consists of some typical statements and opinions about hearing impaired individuals. Parents are requested to circle the answer which best indicates their own feelings about that particular statement.

The questionnaires were sent to all parents of children participating in the study for each of the four years of data collection.

In 1971, the majority of parents (N = 96) returned their questionnaires. However, in subsequent years the return of the Brown Scale was reduced substantially. There were only eleven families who returned their Attitude Scales for all four years.

Part I: General Information: The general information regarding the family and the hearing impaired child have remained relatively constant from year to year. Because the 1971 data yielded the most comprehensive survey of family background information the following brief summary refers to data summarized in the 1971 evaluation report.

In 1971 the summary of questions relating to the parents themselves revealed that the parents were relatively young (mean age = 32.16 years), and well-educated (68 had completed 12 or more years of school, 20 had college degrees and eight had completed some graduate work).

For information on deafness, the parents tended to rely on school administrators or sources other than books and periodicals. Only three families subscribed to any journal and only 50 of the responding parents had ever read any journals or books related to deafness.

Questions concerning hearing impaired children indicated that the hearing impaired child was the first-born in 21 families and the sixth-born in only two families. When hearing loss was suspected, 43 parents originally went to a pediatrician, 22 visited general practitioners, 12 visited audiologists and eight visited otologists. In 13 cases, diagnoses other than hearing impairment were given including mental retardation, "slow development," brain damage and hyperactivity.

Fifty-five percent of the parents reported that their child had begun his/her education in a program for the hearing impaired by the age of 24 months. Seventy-three parents were "very confident" about placing their child in his/her current program. Only four reported "serious lack of confidence." Similarly, 40 parents had visited their child's classroom 12 or more times while only two had never visited the classroom.

Fifty-one parents felt that blindness or cerebral palsy were more educationally handicapping than deafness.

Part II: Your Child Thirty Years From Now: The data consisted of the number of parent responses to each of nineteen statements rated along a five point scale from "very good chance" to "no chance at all." The chi-square statistic (Winer, 1962) was employed to test for differences between the distribution of parents' responses in 1971-1972, 1972-1973, and 1973-1974, and between the parents of children in oral and combined programs.

There have been no significant differences on individual statements from 1971 to 1972, from 1972 to 1973 or from 1973 to 1974. However, in 1972 there was a definite shift toward more neutral responses, perhaps reflecting a trend toward realistic acceptance of the hearing loss.

For all four years modal agreement (largest number of responses in same category) between oral and combined parents was reached on six statements. Parents concurred that there was a "good chance" that their child "will be a college graduate," "will drive a car," "will be close to his brothers and sisters," "will be in good health," "will know his neighbors well," and "will keep in touch with his parents." On four statements, modal agreement occurred for three of the four years. Oral and combined parents agreed that a "good chance" existed that their children "will depend on speech reading more than hearing," and "will belong to organizations of deaf and hard of hearing"; "some chance" existed that children of oral and combined parents "will have more deaf friends than hearing friends" and "will read at about the fifth or sixth grade level or below."

The chi-square statistic was applied to the remaining statements for each year to reveal any significant differences in the pattern of responding between the two groups. Four statements reflected a significant difference in attitude between the combined and oral parents at the .01 and .001 levels of significance (Table 20). No significant differences were found between combined and oral parents for the year 1971.

In 1972, 1973 and 1974 most oral parents felt there was a "good chance" that their child "will graduate from a regular high school" while most parents of children in combined programs felt there was little chance of this occurring. In 1972 and 1974, the majority of parents of children in combined programs felt that there was a "good chance" that their child "will use sign language as his preferred means of communication" and "will use both oral and manual communication," while oral parents felt that this was unlikely. For 1974 only, parents of

Table 20

Your Child Thirty Years from Now: Significant Comparisons between Oral and Combined Parents

Statement	Year	Chi-Square Statistic	*df*	Level of Significance
Will have graduated from a regular high school	1972	$X^2 = 14.1$	2	$p < .001$
	1973	$X^2 = 10.1$	2	$p < .01$
	1974	$X^2 = 15.8$	2	$p < .001$
Will use sign language as his preferred means of communication	1972	$X^2 = 14.7$	2	$p < .001$
	1974	X^2 23.5	2	$p < .001$
Will use both oral and manual communication	1972	$X^2 = 15.6$	2	$p < .001$
	1974	$X^2 = 14.0$	2	$p < .001$
Will have more deaf friends than hearing friends	1974	$X^2 = 9.3$	2	$p < .01$

children in combined programs thought that there was a "good chance" that their child "will have more deaf than hearing friends" while oral parents felt that only "some chance" of this existed. Significant chi-square statistics are summarized in Table 20.

Part III: The data consisted of the number of parent responses to 14 statements, each containing 5 multiple choice answers. Instructions to the parents were as follows:

> Many statements and opinions have been expressed about hearing-handicapped people. We are interested in learning the reactions that you, as the parent of a hearing impaired child, would have to the following statements. Please read each statement carefully. Circle the letter in front of the response which best expresses what you think of or would do about the statement.

Table 21 summarizes questions on which parents of children in combined programs and those of children in oral programs reached modal agreement in three of the four years of the evaluation. For those questions on which these two groups differed, chi-square comparisons by year were computed. The comparison for the following three questions were significant at the .01 level:

> "2. Stuckless and Birch (University of Pittsburgh) report that their study has indicated that manual communication (sign language and fingerspelling) does not hinder the development of speech in the young deaf child (1971, $x^2 = 29.88$, $p < .001$ and 1974, $x^2 = 20.42$, $p < .001$)
>
> b. This is reassuring because I've wondered about that (combined)
>
> d. They mean that this is true if the child has already developed speech before he is exposed to manual communication (oral)"

"12. We all have too little time. Because of this I should devote my short reading time to: 1974 ($x^2 = 23.5$, $p < .001$).

a. Books and articles whose authors know what they're talking about (oral)

c. Learning about methods of teaching the deaf which I disagree with (combined)"

"13. Most deaf people prefer to associate with other deaf people rather than hearing people (1973, $x^2 = 13.49$, $p < .01$ and 1974, $x^2 = 24.50$, $p < .001$).

c. I imagine this is true - they understand each other's speech easier (combined)

d. This is why deaf children should be taught with regular children (oral -- 1973 & 1974)

e. If they are happy doing this - that's fine (oral - 1974)"

Table 21

Questions on which both the Parents of Children in Oral Programs and the Parents of Children in Combined Programs Agreed for 3 of the 4 Years

Question 5: Alexander Graham Bell said, "I think the use of sign language will go out of existence very soon."

d. Bell would never have said that. (1972, 1973, 1974)

Question 8: It is reported that many deaf adults who do not have intelligible speech are successfully employed and well-adjusted.

b. This does not surprise me. (1971, 1972, 1973, 1974)

Question 9: An oral teacher of the deaf claims that many deaf children can't learn to speak and lipread.

e. I agree - some can, but many can't. (1971, 1972, 1973, 1974)

Question 10: One of the disadvantages of getting together with other parents whose children are in my child's school is:

c. There are no disadvantages. (1971, 1972, 1973, 1974)

Question 11: A deaf adult says that he and his deaf friends don't think speech is very important.

c. Possibly he and his friends have found satisfactory adjustment without speech. (1972, 1973, 1974)

Semantic Differential

A measure intended to systematically compare parent attitudes toward concepts related to deafness was designed using the semantic differential technique (Moores, McIntyre & Weiss, 1972). This principle involves rating a concept along a seven step scale between pairs of bipolar adjectives (sad-happy, etc.). The rationale and execution of the semantic differential are complex. The reader is referred to Osgood et al. (1957) for more detailed information and description of the semantic differential as a measurement tool.

It was hypothesized that the parents may differ along dimensions according to the program in which their child is enrolled. Presumably parents have certain attitudes towards various philosophies and methodologies of education either because they have chosen a particular program for their child, or because, through their involvement in their child's program, they have been convinced of the efficacy of a particular program's method. One important aspect of the study is to investigate changes in parental attitudes as the children progress through various educational systems.

The semantic differential scale sent to parents in 1971 was shortened and slightly modified for the 1972 and 1973 evaluation. The same form was used in 1974. The present semantic differential instrument measures attitudes towards the following concepts:

Speechreading-Lipreading
Hearing Impaired
Sign Language
Deafness
Speech
Hearing Aid
Auditory Training
Fingerspelling
Integration of Deaf Child into a Hearing Class

The twelve pairs of bipolar adjectives were chosen on the basis of previous work by the senior investigator. Two minor changes were made in the adjective pairs used in the 1972 form. A sample of the semantic differential developed for the project is presented in Appendix F.

All parents of the sample of children received a copy of the semantic differential to be filled out and returned with the Brown Parent Attitude Scale. As in 1972 and 1973, the return of questionnaires was relatively small in 1974.

In the years from 1972 through 1974, approximately one-third to one-half of the questionnaires have been returned. Few parents returned their questionnaires consistently throughout the four-year period thus hampering any analysis of a longitudinal nature. A survey of the Semantic Differential data across the four-year period revealed only eleven families from four programs with complete data for all years. With a sample of such small size, it is difficult to generalize findings. However, since the analysis of all questionnaires returned for each year from 1971 to 1974 have yielded similar results, the present section will focus on the findings from 1974. The reader is referred to the annual research reports of this project (Moores & McIntyre, 1971; Moores, McIntyre & Weiss, 1972 and Moores, Weiss & Goodwin, 1973) for presentation of specific data for the years 1971, 1972 and 1973.

Results

The basic data consisted of the average of responses on all twelve adjective pairs for each concept. The higher the concept score, the more positive the attitude.

As previously noted, there seem to be no major changes in the attitudes of the parents from 1971 through 1974. For each of the four years, comparisons by *t* test were made between parents of children in oral programs and parents of children in combined programs. Both groups have similar attitudes toward the concepts of *speech*, *speechreading*, *hearing aid*, *auditory training*, *deafness*, and *hearing impaired*. Parents of children in combined programs were significantly more positive toward the concepts of *fingerspelling* and *sign language* for all four years. In 1971, 1972 and 1973 parents of children in oral programs were significantly more positive toward the concept of *Integration of a deaf child into a hearing class*. These comparisons are summarized in Table 22. It remains evident that parents of children in combined programs do not perceive these programs as manual only. *Speechreading*, *hearing aid*, *speech* and *auditory training* all received positive ratings equivalent to *sign language* and *fingerspelling*. All concept comparisons for the year 1974 are depicted graphically in Figure 3. Little distinction is noted between the terms *deaf* and *hearing impaired*.

Parents of children in oral classes do not appear to view *sign language* and *fingerspelling* as negative. Their reactions tend to be neutral.

Table 22

Concepts Showing Significant Differences (t test) Between Parents in Oral and Combined Programs on the Semantic Differential Measure

Concept	1971	1972	1973	1974
Integration of a deaf child into a hearing class	3.11*	5.08**	3.83**	Not Significant
Sign Language	4.46**	5.23**	3.63**	4.07**
Fingerspelling	4.75**	5.38**	3.50**	3.46*

*p < .01
**p < .001

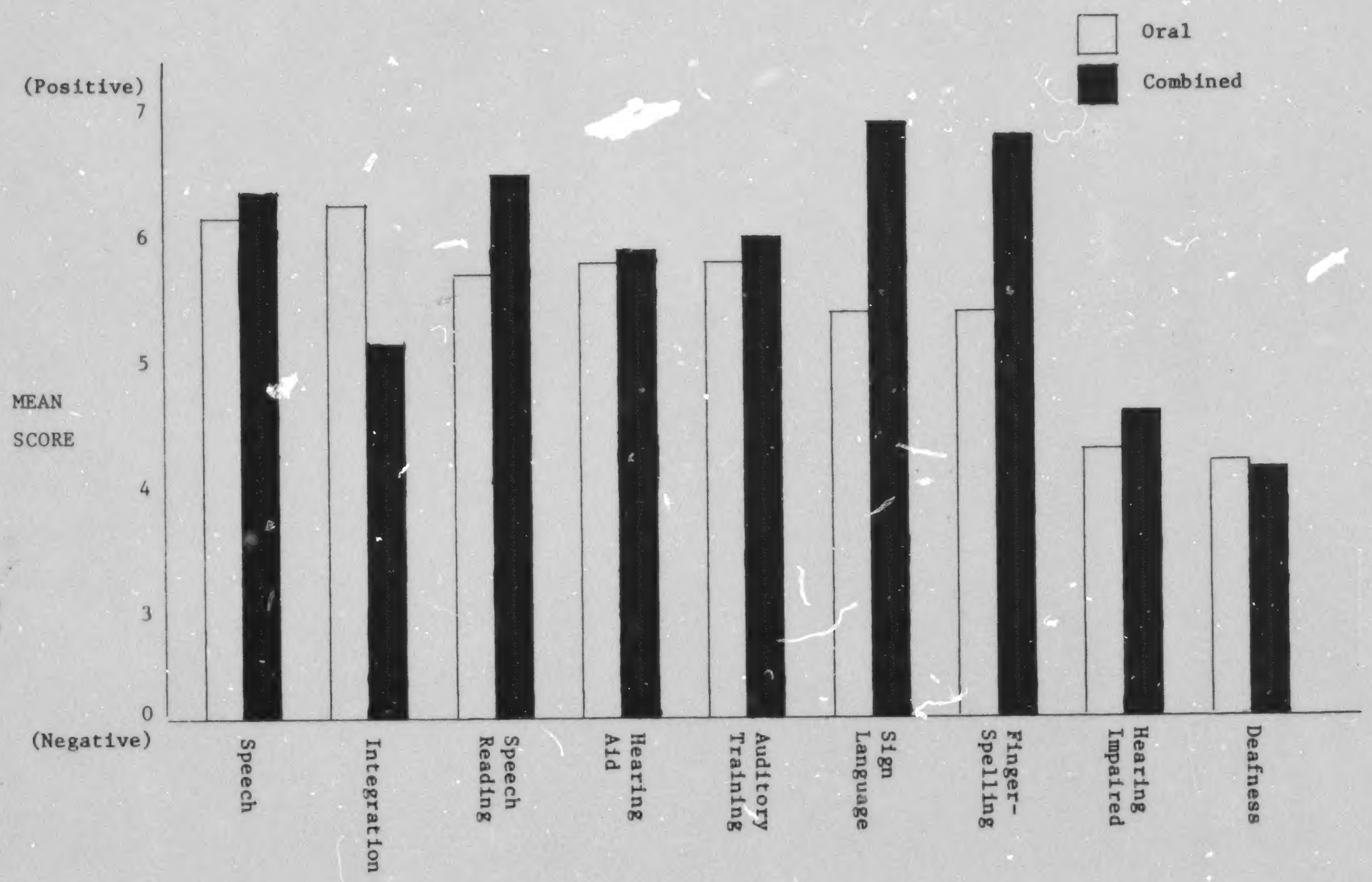

Figure 3. Semantic Differential Measure (1974): Responses by Parents in Oral and Combined Programs

Classroom Observation

During visitations for all four years, observations were made in the three classes containing the largest number of chilren in each of the seven programs. Following each observation, raters used a prescribed format to record the type of activity along with the employed mode of communication for the 45 minute observation period.

Equipment and educational materials in use, or contained within the classroom were noted on the observation form listing items commonly found in pre-primary and primary programs. A modified version of DiLorenzo's (1969) Classroom Observation Schedule with additions appropriate to a population of deaf children was used. While no content changes were made, the format employed in 1973 was revised to expedite the recording and the analysis process for the present year (Appendix G).

Following each observation period, statements were rated on a seven point scale (never to frequently observed) under five major categories:

1) Classroom Organization concerned program organization and implementation on an individual and group basis.
2) Discipline and Classroom Relationships addressed the manner in which any behavioral differences were handled or circumvented. The general classroom disposition was also noted.
3) Structuring Program focused on the relevant use of special materials and implementation of instructional goals and objectives.

4) Encouraging Language and Speech Development pertained to various method(s) employed to foster speech and language growth within the classroom, e.g., discussion periods, controlled practice, planned exposure to concepts.

5) Reaction to Pupil Needs concerned the teacher's recognition and assessment of individual impairments and needs, as well as his ability to effectively adapt the curriculum to the developmental status of each student.

In a supplemental segment of the form entitled Communication Analysis, the various mode of communication employed in the classroom by the teacher and child (child to child, child to teacher, teacher to child) were rated on the same seven point scale.

For the 1971 and 1972 evaluations one pair of raters was employed in the collection of the classroom observation data. However, for subsequent evaluations a different pair of raters was responsible for observation data and other facets of the evaluation. This variability in raters and changes in methodology and philosophy within programs and across years resulted in a multiplicity of variables which confounded the data, thereby limiting its usefulness. For these reasons it was deemed appropriate that a descriptive presentation of the findings would be the most meaningful for readers of this research report.

Results

Consistent with findings of the past three years, the amount of equipment and materials available to teachers in all classrooms was extensive. An increase in the presence of academic materials was attributed to the fact that most children are enrolled in early primary level classes. One of a variety of auditory units was housed in each classroom observed, some of which could be used by the subjects outside of the classroom setting.

The raw data were converted to the average rating of the two observers for each item. Program scores consisted of the mean of these combined scores for items in each of the five categories.

Table 23 presents program scores by year for the Classroom Organization category. The range of mean program scores across the four years is less than one point (.88). It appears that for this subsection of the observation schedule there was greater variability among programs at the time of the 1971 (2.44) evaluation, and with each successive year this range decreased from 1.90 in 1972 to 1.61 in 1973 to 1.38 in 1974.

As can be seen in Table 24, a consistent ranges among programs toward Discipline & Classroom Relations was prevalent for two of the four years (1.32 in 1971 and 1.33 in 1974). For 1973, less variability was apparent (.67). Although a slight increase was noted during 1972 (1.51) the increase was minimal. The range of mean program scores was again less than one point (.88).

While the range of mean program scores across the four years continued to stabilize at less than one point (.77), the consistency of the range among programs fluctuated slightly in the Structuring Program category (Table 25). For the first and last years of the evaluation (1971 and 1974 both at 1.39), less variance was observed than during

Table 23

Classroom Observation Schedule: Classroom Organization

Program	1971	1972	1973	1974	Cumulative Program Mean
A	6.33	4.22	4.39	4.96	4.98
B	5.39	4.24	4.48	5.11	4.80
C	--	5.94	3.93	5.37	5.08
D	4.15	4.04	4.43	4.19	4.20
E	4.45	4.76	5.54	5.57	5.08
F	3.89	4.56	4.67	5.31	4.60
G	5.61	5.19	4.54	4.72	5.02
Yearly Mean	4.97	4.70	4.57	5.03	4.82
Range	6.33-3.89	5.94-4.04	5.54-3.93	5.57-4.19	5.08-4.20

Table 24

Classroom Observation Schedule: Discipline and Classroom Relations Subscale

Program	1971	1972	1973	1974	Cumulative Program Mean
A	5.55	4.65	5.13	5.35	5.17
B	4.86	5.02	5.03	5.28	5.04
C	--	6.16	5.20	5.76	5.70
D	4.32	5.55	4.87	4.54	4.82
E	5.18	5.87	5.54	5.87	5.62
F	5.11	5.72	5.07	5.50	5.35
G	5.64	5.67	5.24	5.17	5.43
Yearly Mean	5.11	5.52	5.15	5.35	5.30
Range	5.64-4.32	6.16-4.65	5.54-4.87	5.87-4.54	5.70-4.82

Table 25

Classroom Observation Schedule: Structuring Programs Subscale

Program	1971	1972	1973	1974	Cumulative Program Mean
A	6.06	4.75	5.32	5.33	5.36
B	5.09	3.79	5.17	5.35	4.85
C	--	5.50	4.65	5.81	5.32
D	4.67	4.77	5.15	4.42	4.75
E	5.03	5.21	5.77	6.06	5.52
F	4.81	4.88	5.92	5.63	5.31
G	5.72	5.31	4.23	5.50	5.19
Yearly Mean	5.15	4.88	5.17	5.44	5.19
Range	6.06-4.67	5.50-3.79	5.92-4.23	5.81-4.42	5.52-4.75

the median years (1.71 in 1972 and 1.69 in 1973) where the range in scores was somewhat larger.

In the category of Encouraging Language and Speech Development (Table 26) there appears to be little variation across years or among and within programs. The range of cumulative mean program scores for the four years is approaching one point (.99). Yearly average scores exhibit slight and inconsistent variability ranging from 1.62 in 1971 to 1.33 in 1972 to 1.42 in 1973 and 1.40 in 1974.

Although the range of cumulative mean program scores for the Reacting to Pupil Needs (Table 27) subscale is the largest noted in any of the five subscales it is still relatively small (1.06). Again the patterning of average yearly scores is inconsistent; however, in 1971 a greater discrepancy between programs was noted (2.32).

Communication Analysis

The degree and mode in which children communicated with each other and with their teachers were rated on a seven point scale from "never" to "frequently." Scores were computed in the same manner as in the previously discussed portion of the questionnaire. Because the focus of this portion of the observation schedule was to assess the consistency of classroom communication patterns with the official program methodology, program scores have been combined according to methodology by year. A summary of program methodology by year is presented in Table 3.

Child to Child

For the oral programs from 1972 to 1974 the most frequently employed

Table 26

Classroom Observation Schedule: Encouraging Language and Speech Development Subscale

Program	1971	1972	1973	1974	Cumulative Program Mean
A	4.62	4.04	5.08	5.21	4.74
B	5.50	4.96	4.46	5.08	5.00
C	--	5.37	5.50	5.58	5.48
D	4.63	4.87	4.29	5.21	4.49
E	4.44	5.12	5.46	5.71	5.18
F	4.01	4.75	5.33	5.46	4.89
G	5.63	5.19	4.08	5.00	4.98
Yearly Mean	4.80	4.90	4.88	5.18	4.97
Range	5.63-4.01	5.37-4.04	5.50-4.08	5.71-4.21	5.48-4.49

Table 27

Classroom Observation Schedule: Reacting to Pupil Needs Subscale

Program	1971	1972	1973	1974	Cumulative Program Mean
A	6.21	4.33	6.00	5.62	5.54
B	5.14	4.60	5.21	5.55	5.13
C	--	5.57	4.98	5.76	5.44
D	3.89	4.07	5.43	4.60	4.50
E	5.19	4.76	5.95	5.98	5.47
F	4.36	4.86	6.02	5.81	5.26
G	5.82	5.68	5.19	5.55	5.56
Yearly Mean	5.10	4.84	5.54	5.55	5.27
Range	6.21-3.89	5.68-4.07	6.02-4.98	5.98-4.60	5.56-4.50

mode of communication was oral-aural followed closely by gestural communication. In 1971 gestures were the most frequently noted mode of communication among children while the oral-aural mode was the next most frequently employed. In all years except 1972 signing among children was also noted.

Within combined programs in 1971 gestural communication was the most commonly used modality followed closely by the oral-aural and sign categories. However, in combined programs from 1972 to 1974 children employed signs, without accompanying verbalization most frequently when conversing among themselves. The second most frequently used modes of communication were oral-aural and gestural in 1972 and combined and gestural in 1973. By 1974, scores in the combined category dominated the secondary position.

It is interesting to note that scores in the combined category exhibited the greatest increase across the four year period. Although scores in the gestural category are relatively high for the children in combined programs they do not approximate the magnitude of those of children in oral programs (Table 28).

No written communication between children was observed in either oral or combined programs.

Child to Teacher

Table 29 summarizes interaction scores from child to teacher. In oral programs for all four years the oral-aural mode followed gestures were the most frequently noted types of communication from child to teacher. However, signs were also observed from 1971 to 1973. No

Table 28

Communication Analysis by Year (Child to Child)

Programs		Fingerspelling	Sign	Oral-Aural	Combined	Written	Gestures
Oral	1971	1.00	1.83	2.21	1.00	1.00	3.17
	1972	1.00	1.00	3.50	1.00	1.00	4.09
	1973	1.00	1.75	4.38	1.00	1.00	4.21
	1974	1.00	1.25	5.25	1.00	1.00	4.50
Combined	1971	1.58	1.79	1.92	1.17	1.00	3.33
	1972	2.33	3.62	2.98	1.58	1.00	2.93
	1973	2.17	5.05	3.03	3.72	1.00	3.72
	1974	2.71	4.91	3.24	3.74	1.00	2.93

Table 29

Communication Analysis by Year (Child to Teacher)

Programs		Fingerspelling	Sign	Oral-Aural	Combined	Written	Gestures
Oral	1971	1.00	2.00	3.33	1.00	1.00	2.76
	1972	1.00	1.09	4.91	1.00	1.00	3.42
	1973	1.00	1.13	5.25	1.00	1.00	3.54
	1974	1.00	1.00	5.50	1.00	1.00	3.50
Combined	1971	2.50	2.25	2.42	1.17	1.25	2.67
	1972	2.32	3.57	3.87	2.00	1.33	2.83
	1973	2.41	4.75	3.86	3.75	1.36	3.19
	1974	3.26	4.91	4.00	4.28	1.12	2.64

written communication was observed in any of the four years.

Communication from child to teacher in the combined programs exhibited a less stable pattern across years. In 1971 scores for three modalities were relatively close; the most frequently observed mode was gestures followed by fingerspelling and oral-aural communication. The oral-aural style of communication and secondly signs were the most frequently noted in 1972. Scores in 1973 and 1974 are somewhat similar in that the category most often employed was sign. Scores for the secondary modality fluctuated between the oral-aural and combined categories.

Again, the greatest increase in scores occurred in the combined category where scores rose from 1.17 in 1971 to 4.28 in 1974.

Teacher to Child

Examination of Table 30 indicates that again communication in the oral classrooms was stable across years. The most frequently employed method of communication for each year was oral-aural, followed by gestures. Written communication from teacher to child was observed in 1971, 1972 and 1974, while some signs were noted in 1971.

Again, for combined programs the patterns of communicative modalities is less clearly defined. For the years 1971 and 1972 oral-aural communication was the most commonly employed. The secondary position was held by the fingerspelling mode in 1971 and the sign mode in 1972. In 1973 and 1974, the high scores cluster in three categories, sign, oral-aural and combined with the highest score occurring in the sign category in 1973 and the combined category in 1974. The amount of com-

Table 30

Communication Analysis by Year (Teacher to Child)

Programs		Fingerspelling	Sign	Oral-Aural	Combined	Written	Gestures
Oral	1971	1.00	1.17	6.92	1.00	2.00	2.50
	1972	1.00	1.00	6.50	1.00	2.33	3.50
	1973	1.00	1.00	6.37	1.00	1.00	4.00
	1974	1.00	1.00	6.75	1.00	1.75	4.00
Combined	1971	5.33	2.42	6.00	1.67	2.00	2.33
	1972	3.57	3.98	6.28	3.12	2.63	2.20
	1973	4.03	5.17	4.75	4.95	1.75	3.33
	1974	4.52	5.19	5.02	5.24	1.56	2.36

bined oral-manual communication used by teachers increased dramatically from 1.67 in 1971 to 5.24 in 1974.

The observation of written communication appears consistent between oral and combined programs across years.

Chapter 4

DISCUSSION

The findings will be discussed following the order of presentation of results of Chapter 3. The reader is referred to that section for the tabular and narrative presentation of data.

Weschler Intelligence Scale for Children (WISC) Performance and Leiter International Performance Scale (Table 4 and Figure 1)

Inspection of the WISC Scores obtained in 1974 indicate that the subjects are functioning within the normal range. However, the overall WISC performance IQ of 110.17 is somewhat above the hearing norm. Comparisons by program reveal no significant differences, thus the test has not identified any unique program differences that might influence performances on other measures. Although the WISC and Leiter scores are significantly correlated ($r = .54$, $p < .001$), the overall WISC scores are somewhat lower than those of 116.57 obtained on the Leiter Performance Scale in 1970. Similarly, Quigley (1969) reported a decline in scores on a sample of deaf children tested originally on the Leiter at age three and retested four years later on the WISC.

Illinois Test of Psycholinguistic Abilities (ITPA)(Table 8 & 9 , Figure 2)

The overall mean scores of 176.96 in 1972, 180.03 in 1973 and 180.65 in 1974 indicate that the functioning of the young deaf children in the study on visual motor subtests of the ITPA is essentially normal. The overall predicted mean score for children with normal hearing would be 180. These scores seem to indicate strong stability over a period of years and strengthens the conclusion that the deaf children function at normal levels on the abilities tapped by ITPA visual motor subtests. Because subjects have maintained scores equivalent to their hearing age group over the period of two calendar years, there is evidence to suggest that the rate of growth is also normal. The relatively low score for the 1971 testing may be explained by the authors' original reaction that some subtests initially provided spuriously low estimates of deaf children's abilities because of moderately elaborate verbal directions and, in the case of Visual Closure, the involvement of timed tasks.

In the years 1972-1974, scores by subtest present graphic evidence of the lack of differences between the deaf subjects and the hearing standardization population on four of five subtests. During this three-year period, the only statistically significant difference shows the deaf students to be superior in Manual Expression which was the only subtest in which the average score of children in each of the seven programs was above the hearing average of 36. The consistency of the results lends credence to the hypothesis, originally stated in the 1971-72 report, that deaf children, in developing mechanisms to cope with the environment, acquire superior skills in this area.

Previous examinations of ITPA scores by programs indicated no significant differences from 1972-1974. The originally large range of scores among programs noted in 1971 had decreased substantially. However, in 1971 and 1972 scores on the ITPA were sensitive to the amount of academic cognitive content in a particular program. In 1973 and 1974 this sensitivity decreased, perhaps because as the children matured programs began employing more academically centered curricula. The evidence suggested that those programs in which children consistently have been above the hearing norms are those which have had a consistent academic orientation from their inception.

Academic Achievement - Metropolitan Achievement Test (MAT) Primer Battery and Metropolitan Readiness Test (MRT) (Tables 10 and 11)

Academic achievement of the sample, as assessed by the MAT Primer Battery, Reading and Arithmetic Subtests, appears to be comparable to that of hearing children of approximately the same age in the area of reading and below that of their hearing counterparts in the area of arithmetic. These findings are consistent with those of the 1973 Metropolitan Readiness Test data which illustrate that deaf children scored significantly higher on the reading related tests of Matching and Alphabet while their performance on the Numbers test was significantly lower than that of the standardization sample. It was postulated that the relatively poor performance on the Numbers test might be attributed, at least partially, to the fact that all questions were presented verbally.

Although the verbal nature of the MAT Arithmetic subtest may still account in part for the relatively poor performance of the deaf subjects on computational tasks the second year of data lend further support to indicate that perhaps the children are functioning below their hearing counterparts in the area of Arithmetic. At this point, the programs appear to be emphasizing the development of reading at the expense of computational skills.

Results of a nationwide survey of hearing impaired children and youth conducted by the Office of Demographic Studies Gallaudet College (1972), produced similar trends. Using the Stanford Achievement Test to assess the achievement level of 16,680 deaf children and young adults, it was found that the mean arithmetic performance of all students tested (6-21 years old) was superior to that in reading comprehension. However, analysis by age revealed that between the ages of 6-8 years (the age of the sample in the current inquiry), reading scores were higher than arithmetic. This is the only age range at which such findings have been found. For all older age groups, (9-21 years) reading scores exceeded these of arithmetic.

Since different measures were employed in the studies, a direct comparison of results is inappropriate. The Gallaudet study does however lend tentative support to the premise of the present study, that perhaps development of arithmetic skills is not emphasized in programs for the deaf until after age 8.

Although the children appear to be developing reading skills comparable to hearing children now, it must be reemphasized that none of the programs has succeeded in developing English language skills comparable to those of hearing children. Results of tests of expressive and receptive communication in the current investigation indicate that the children in the sample experience difficulty with complex grammatical structures. Even though they possess adequate pre-reading skills, it is predicted that as they became older and reading content includes more complex linguistic structures (e.g., passive, negative, interrogative construction) the scores of these children, relative to the hearing, will decline.

Communication Battery

Receptive Communication, Core Items (Tables 12-15)

In terms of relative efficiency across modes, the results were consistent for the three years from 1972 to 1974 with the exception of the Printed Word. Excluding the Printed Word, children received communication most efficiently when stimuli were presented simultaneoulsy through Speech and Signs, followed by simultaneous Speech and Fingerspelling. A further decrease in scores was noted in the Speechreading and the Sound Alone mode, with the most inefficient means being Sound Alone, i.e., reliance on hearing alone, without the benefit of visual clues. It appears that the addition of each dimension, Sound plus Speechreading plus Fingerspelling plus Signs adds an increment of intelligibility. In corroboration of previous results, it is also apparent that the use of manual communication does not detract from oral receptive skills.

Presentation of data in Table 12 indicates an increase in receptive communication scores from 1972 to 1973 to 1974. The smallest gains from 1973 to 1974 are noticed in the Sound Alone subtest, while the greatest improvement in reception of communication modes was noted in the Printed Word subtest in which scores increased from 38% in 1972 to 56% in 1973 to 76% in 1974. This reflects continued emphasis in the development of pre-reading and reading skills and supports the original decision of the authors to treat understanding of the Printed Word separately from the other four subtests, which are more measures of person-to-person interaction.

Intratest correlations by mode of communication have produced an interesting pattern over the three years. In 1972, there was only one significant correlation between measures. In 1973, Fingerspelling was highly related ($p < .001$) to the Speechreading mode. By 1974, seven of ten intratest correlations were significant ($p < .01$). The results have several major implications. First, it is possible in early stages, perhaps below age six, receptive communication across various modes entails reliance on relatively different processes. By ages six to eight, however, communication skills across modalities became increasingly more interrelated. It may be hypothesized that by this age the underlying processes may be similar and the modality of presentation of relatively lesser importance. It appears that a child who develops proficiency in one mode will be likely to develop adequate skills in the others. Still, not all measures are significantly correlated. For example, the lowest measured correlation (.08, NS) in 1974 was between the Printed Word and Sound Alone, the two modes which one intuitively would predict to be least related in that one relies completely on vision and one on audition. It is interesting to speculate on whether these two modes also would become significantly related as the children mature. If so, it would give greater credence to a generalized underlying information processing model.

Another finding worthy of note is that Fingerspelling was the only mode significantly correlated with all four other modes of communication in 1974, and that the only significant correlation in 1973 involved Fingerspelling and Speechreading. Given the nature of the task, such a result might logically be predicted. The Fingerspelling mode, in which the child simultaneously listens, speechreads and decodes fingerspelling, incorporates elements from all other modes. Listening is involved; fingerspelling has a one to one correspondence to the Printed Word; Speechreading is an important factor in the process; and Fingerspelling and Signs both are elements of a more generic process of manual communication.

The two modes which appear to be least related to the others are Sound Alone and Sign Language. Sound Alone is not significantly correlated with either the Printed Word or with Sign Language, which in turn is not correlated with Speechreading. As previously noted, low correlations might be expected between the Printed Word and Sound Alone modes. However, since the Sign Language subtest, like the Fingerspelling subtest, also involves the use of audition and speechreading, it is less clear why Sign Language is not significantly correlated with Sound Alone or Speechreading. Although there is a positive correlation (.24, NS) between Sign Language and Speechreading it is much smaller than that between Fingerspelling and Speechreading (.50, $p < .001$) or Fingerspelling and Sign Language (.60, $p < .001$). It is possible that the decoding of messages involving sign language involves processes that are somewhat less related to audition and speechreading than the decoding of messages involving fingerspelling.

During the three-year period correlations of hearing loss to the various modes of communication revealed highly significant relationship of hearing loss to the Sound Alone and Speechreading subtests.

The relationship of hearing acuity to Sound Alone is an obvious one in that as the degree of hearing decreases so too does one's ability to receive information auditorily. Again, the importance of auditory input to information received in the Sound plus Speechreading condition is noted in the hearing loss to Speechreading correlation. The lower correlations of hearing loss to Fingerspelling and Sign Language modes indicated that children are less dependent on residual hearing for success in these tasks. Given the consistently higher scores for these modes across three years, the authors conclude that the traditional auditory-only and oral-aural methods are inappropriate for children with profound hearing losses. Combined oral-aural-manual input appears to be much more effective. These results are consistent with findings in other aspects of the study. Whether the manual component should involve fingerspelling alone or signs plus fingerspelling is unclear at present.

Receptive Communication: Negatives, Passives, Verb Tenses (Table 16)

Although scores on the receptive communication core items suggest consistent improvement in program functioning over a three-year period, the most difficult linguistic constructions tapped are of the Subject-Verb-Object or Subject-Verb-Prepositional Phrase types, that is active declarative sentences addressed to the present. In view of the extensive literature documenting the difficulties that most deaf children encounter in comprehension of verb tense, passive voice and other complex grammatical constructions, the 1974 data gathering also included measures of this type.

The results are less promising that those found for the core items and suggest that all programs need to devote more attention to mastery of various English structures.

Analysis of error patterns reveals the discouraging finding that deaf children chose the reverse interpretation of negatives and passives more frequently than they chose the correct one. For example the overall percentage of correct responses for passives was 29% with subjects choosing the reverse (incorrect) interpretation of the passive sentences 47% of the time (Table 16). It appears that deaf children frequently employ the active interpretation of passive phrases and ignore the passive marker "by."

Similarly, the overall percentages of correct responses for negatives was 36% with subjects choosing the incorrect positive interpretation of the negative 46% of the time. The children tended to ignore negative cues and select the opposite meaning more frequently than the correct one.

The results obtained are similar to those obtained by Power (1971) and Schmitt (1969) who studied deaf children between 8 and 18. Both investigators found deaf children tended to ignore linguistic markers and typically processed all sentences as active declaratives. The situation is doubly serious. Not only do deaf children commonly fail to interpret passive sentences and negative sentences but they frequently derive information which is the opposite of that which was intended.

The same pattern is clear with regard to verb tenses. The overall score of 39% is close to the chance level of 33%. It appears that the majority of subjects do not recognize basic verb tenses consistently.

The Printed Word tended to facilitate recognition of both negatives and passives, but not necessarily tenses. The superiority of the Printed Word is especially evident in the Passive subtest in which Printed Word scores were significantly higher than those of the Sound Alone, Speechreading and Fingerspelling modes. It appears that complex constructions are introduced to the children primarily through print and that they are not employed consistently in face to face communication whether it be oral-only or combined oral manual instruction. The results clearly indicate that introduction of manual communication, while helpful, does not automatically solve the problems of deaf children understanding English messages. All programs must develop specific training procedures to provide additional practice in the use of English constructions in person to person communication as well as in reading. This should involve audition, oral-aural, oral-aural-fingerspelling and oral-aural-fingerspelling-sign modes.

The results lead the authors to believe that adequate mastery of these components of the English language will not be achieved unless the programs consciously address themselves to developing specific activities in which the children have the opportunity to practice different basic constructions of English. This statement holds regardless of method utilized.

Expressive Communication

The results of the expressive communication component represent the most complex aspect of the survey. The results are presently being analyzed for linguistic and semantic content, mode of expression, and understandability, as a function of the status of raters (deaf adult, hearing adult, hearing adult proficient in manual communication). The results are complex enough and the implications important enough to be treated extensively in a separate monograph on which work has been initiated.

As expected, interpreters made more correct identifications (56.66%) than Deaf Adults (31.41%) and Graduate Students (19.54%). It is of interest to note that while the interpreters were processing information both auditorily and visually little more than half of the subjects' expressive attempts were correctly identified. Such results seem to suggest some lack of effectiveness in the children's overall communication abilities and imply that their communicative styles are best understood by those who interact with them on a frequent basis.

Analysis of the preferred mode of communication by children indicates that the most commonly employed mode was total communication (simultaneous oral-manual), N = 18, followed by oral, N = 17. The variation across subjects was extensive. Distribution of preferred mode of communication within programs was presented in the previous reports has indicated that while each participating program implements a particular methodological approach to instruction, students seem to have developed personal communicative styles often reflective of, but not necessarily limited to the given philosophy of communication employed by particular programs.

Articulation (Table 17)

It should be emphasized that scores on the articulation test do not represent measures of language per se as they are ratings of single words uttered in isolation. The authors, therefore, feel that the generalization of these scores of spoken, written, finger-spelled or signed language is inappropriate.

Although the use of different recording systems and raters across the three years may have affected the articulation scores somewhat, this variation does not appear to account for the consistently low scores obtained for each year. As noted in earlier research reports, each year the range of identifiable articulation attempts approximated 90 percentage points across subjects. This illustrates the broad scope of abilities and further emphasizes the lack of change with respect to the lower scoring children.

The overall lack of measurable gain in articulatory skills across subjects promotes some question as to the effectiveness and consistency of strategies directed toward the improvement of speaking ability.

In addition, evidence over the three years indicates a significant relationship between hearing loss and articulation scores.

Matching Familiar Figures Test (MFF)

In an attempt to assess the "perceptual tempo" (Kagan, 1965) of the subjects, the MFF was administered in 1973 to determine whether a proportionately larger number of children classified with an etiology of rubella might appear in the "impulsive" category. The lack of differences by etiology suggests that rubella children with no handicaps other than deafness are not more "impulsive." Whether these findings generalize to a population of multiply handicapped rubella children remains uncertain.

Reflective children were superior only on those subtests of the ITPA (Visual Closure) and MRT (Copying and Matching) which were timed. Thus it is possible that impulsive children in this sample may not be inferior on pre-reading skills but rather, tend to use inappropriate strategies when performing under the constraints of time.

Cognitive Development Measures (Tables 18-19)

The results of the Piagetian-based Cognitive Development Measures reflect a range of scores from 32.2 to 33.8 (Table 18). A range of this small proportion clearly indicates that the measures no longer discriminated among programs or subjects. In 1973, children from one program which had incorporated a "Piagetian" component within its preschool, were superior in this area. At that time it was suggested that their superiority on cognitive based tasks did not appear to generalize to performance on other tests with similar bases. By 1974, the children in other programs were achieving at the same level as children involved in the Piagetian-based program. It therefore appears that the earlier superiority was due to task familiarity and that the type of activities utilized had no effect on the development of abilities in this area.

Correlations of Cognitive Development Measures with other measures (Table 19) revealed, however, that an individual's functioning is related to functioning in other areas. As might be expected scores on the Seriation task are significantly correlated with the MAT Numbers Subtest ($p < .01$) and Total ITPA scores ($p < .001$). Interestingly enough, none of the scores are correlated significantly with the MAT Reading subtests.

Regular Class Subjects

The question of integration has received growing attention because of the recent, widespread trend toward "mainstreaming" of handicapped children. On the basis of the information available from the present study, integration seems to be an administrative device with little impact on the children served.

For the children studied integration does not appear to promote or hinder academic achievement, nor is there a visible relationship to academic performance or achievement as measured by Metropolitan Achievement Test scores. Further, integrated children seem to be those who most nearly approximate the "norm" with fewer obvious physical differences. Speech is one of the most tangible physical abilities and integrated children have more closely approximated hearing children in that respect. Unfortunately, there is little evidence that regular classrooms make any effort to accomodate deaf children with less intelligible speech, even if they are high achievers academically.

It is interesting to note that the only difference between integrated deaf children and those in self-contained classes is articulation. It appears that integration decisions are made on the basis of hearing loss and speech abilities alone. Those children who were integrated were speaking more clearly in 1972 prior to integration. Thus, it must be emphasized that children do not speak better because they were integrated, but rather, they are integrated because they speak better.

Parent Attitudes

Because the proportion of parents responding to the Parent Attitude and Semantic Differential Scale has been relatively small, the extent to which replies can be generalized is questionable and the results must be treated tentatively.

Brown Parent Attitude Scale (Tables 20-21)

Reactions of parents from 1971 to 1973 mistated a trend toward more neutral and more realistic attitudes. To a large extent parents of children in oral programs tended to react more similarly to parents of children in combined programs. For example, parents of children in the oral program originally believed (1971) that the major goal of an educational program for the deaf was to develop speech and speechreading skills but came to agree in 1972 and 1973 that the major function should be the provision of instruction in academic skills, i.e., reading, language and writing. By 1973 the differences which remained were concerned primarily with educational placement and desirability of manual communication.

Differences appeared to be somewhat greater in 1974. Parents of children believed to a greater extent that their children "will graduate from a regular high school," "will not prefer sign language," "will not use both oral and manual communication" and "will have more hearing than deaf friends." The parents of children taught by Oral-Only methods now represent a minority of the survey. The fact that many of these children have been mainstreamed in regular class settings and that parents may anticipate continued integrated placement could account for the nature of the parental responses.

Semantic Differential (Table 22)

Results from 1971 to 1974 are similar in that parents of children in combined programs tend to perceive speech, speechreading, hearing aid, auditory training, sign language, and fingerspelling as good, relatively equivalent concepts, obviously viewing their children's programs as oral-manual and not oral-only or manual only.

Parents of children in oral programs have responded similarly. The only significant differences are in responses to fingerspelling and sign language, which they regard as neutral to good, but not as good as noted by parents of children in combined programs.

Both sets of parents continue to view deafness and hearing impaired as equivalent terms. The results indicate little change in attitude over the past four years.

Classroom Observation Schedule (Tables 23-27)

In discussing the classroom observation data the reader is reminded that the results should be treated as tentative for the following reasons:

1. Raters were not consistent across years
2. Teachers were not consistent across years
3. Program methodologies and philosophies did not remain consistent across years

Given the number of changes that have occurred within the four years, it has become difficult to effectively analyze the data and ascertain accurately the source of yearly program variability.

In light of the aforementioned concerns, some variability across years was noted in the Reacting to Pupil Needs and Classroom Organization subscales in which the range of program scores exceeded two points for the year 1971. However, as the children matured and entered more conventional primary settings, these differences dissipated.

Differentiation among programs across the four years has been slight. Overall, cumulative program mean scores and yearly mean scores fall between 4.5 and 5.5. Further analysis of the data reveals that only on six occasions were individual program scores above 6.0 or below 4.0, again indicating that programs in general are operating at similar levels.

In conclusion, it appears that findings for the Classroom Observation Schedule may be inconclusive either due to masking of program differences by confounding variables, or because the observation schedule has not been sensitive to program changes over time.

Communication Analysis (Tables 28-30)

Examination of Tables 28, 29 and 30 reveal a great variety in the amount and type of communication that takes place. This is explained by the different modes of communication employed and by differences between programs regarding their philosophy concerning personal interaction.

Child to Child

For the period from 1971-1974 children in oral programs employed oral communication most consistently. Considerable use of gestures and signing was also observed, perhaps, suggesting that when children do not have formal signs at their disposal, they must resort to gestural communication to some extent.

While communication performance in Combined Programs is somewhat erratic and basically manual for the initial years of the evaluation, it appears that during the later years a more combined oral-manual approach to communication was employed as well.

Child to Teacher

While some signing was noted, children tended to generally employ an oral-aural communication style supplemental by gestures. Again, as in Child to Child communication the reliance on gestures appears to be substantial.

Despite some instability in child-to-teacher communication for combined programs, in 1971 and 1972 it appears that children have continued to use signs as a communication tool. As increase in signing accompanied with verbalization was more frequently observed during the latter two years of the study.

Teacher to Child

Oral-aural followed by gestural communication from teacher to child seems to have predominated in oral classrooms across the four years. Similarly, written communication was observed for three of the four years, while in 1971 some signing was demonstrated. Again, a strong gestural component was noted in the communication process within the oral classroom.

The initial years of the evaluation illustrate that in combined programs, the oral-aural approach was most commonly employed, following by fingerspelling in 1971 and sign in 1973.

Sign, oral-aural and the combined methodology most frequently noted in 1973 and 1974, therefore illustrating that teachers are moving toward more effective utilization of simultaneous oral-manual communication. By 1974, teachers were employing the combined methodology most frequently.

Total Classroom Interaction. For the last two years of the evaluation there has been a consistency in the most frequently observed modes of communication across the three types of classroom interaction. In addition, by 1974 all programs appeared to conform to the methodology officially adoped by their programs. However, some discrepancies, were noted.

Examination of teacher-child communication patterns reveals there is no "pure" program; perhaps there should not be. For 1973 and 1974, programs endorsing simultaneous oral-manual communication, the combined category tends to be most frequent but is followed closely by oral-aural communication. Obviously, teachers do not sign and spell everything they say.

Other discrepancies may be noted in children's modes of communication. First, children in both the Rochester Method school and oral programs were observed signing to each other, and in some cases, to teachers. Secondly, in no program was there a direct one-to-one relationship between oral communication and its manual counterpart. In all cases, spoken communication without an accompanying sign or finger-spelled word or, less frequently, manual communication without verbalization were observed. In this context, the flexibility of the children is impressive. They appear to have three modes of communication at their disposal: Oral-Aural, Simultaneous Oral-Aural Manual, and Manual. Although there is more of a tendency to use the Oral-Aural with teachers (most of whom hear) and the Manual with classmates, the children apparently adapt with little or no difficulty.

The evidence over four years strongly indicates that reliance on an Oral-Only system greatly limits all aspects of communication--child-child, child-teacher, and even teacher-child. Both children and teacher are forced to develop a gesture system to the extent that the program, much as it may be denied, evolves an oral-gestural system.

Chapter 5

SUMMARY

This 1975 monograph and earlier research reports (1972-1974) will provide the basis for the development of curriculum guidelines for preschool programs for hearing impaired children. Some of the major outcomes of current analyses indicate that:

our subjects continue to approximate the hearing norms on four of the five Illinois Test of Psycholinguistic Abilities visual motor subtests (Visual Reception, Visual-Motor Association, Visual Sequential Memory, Visual Closure). Relatively higher scores have been illustrated in the area of Manual Expression, indicating that deaf children may develop superior skills in this area.

Results of the Receptive Communication Scale reveal a hierarchy of intelligibility across the modes of communication tested. The least efficient receptive mode was sound alone. Performance improved with the addition of speechreading and further improvement was noted in the sound and speechreading plus fingerspelling mode. The sound and speechreading plus sign language mode was proven to be the most efficient mode of receptive communication.

It appears that while manual communication facilitates the reception of information, when more highly complex grammatical structures i.e., passives, negatives and verb tenses, are introduced the reception of such information is inefficient regardless of the mode of communication used.

In academic achievement the deaf children exhibited reading skills comparable to hearing peers. Math scores were below those of hearing counterparts, indicating that computational skills receive less emphasis within the academic program.

The overall lack of improvement in articulation scores across the three years raises questions as to the effectiveness of present habilitative techniques employed in improving the speaking ability of those children who have scored consistently at the lower range on this measure.

Those children who have been selected by their respective programs for placement in regular classroom situations have illustrated no superiority in academic achievement, communication or psycholinguistic abilities. Integration into mainstream education appears to neither hinder nor promote academic success. "Mainstreamed" subjects differ from those who have remained in classrooms for the hearing impaired only in degree of hearing loss and articulation ability. Integrated children possessed greater hearing acuity and better articulation skills prior to integration, suggesting that integration is not a causative element in the enhancement of articulation ability. It appears that children do not speak better because of integration, but rather are integrated because they speak better.

Summarily, as the participants of this investigation progress through the educational process it has become increasingly more evident that there exists within programs a complex interaction among program emphasis, structure, orientation and methodology. Hence, it is this complex interaction rather than specification of any particular methodological approach to education which seems critical to success in school. Consideration of this factor and the aforementioned outcomes of this longitudinal evaluation will provide the function for the forthcoming guidelines which will focus on issues of practical importance in the education of the young deaf child.

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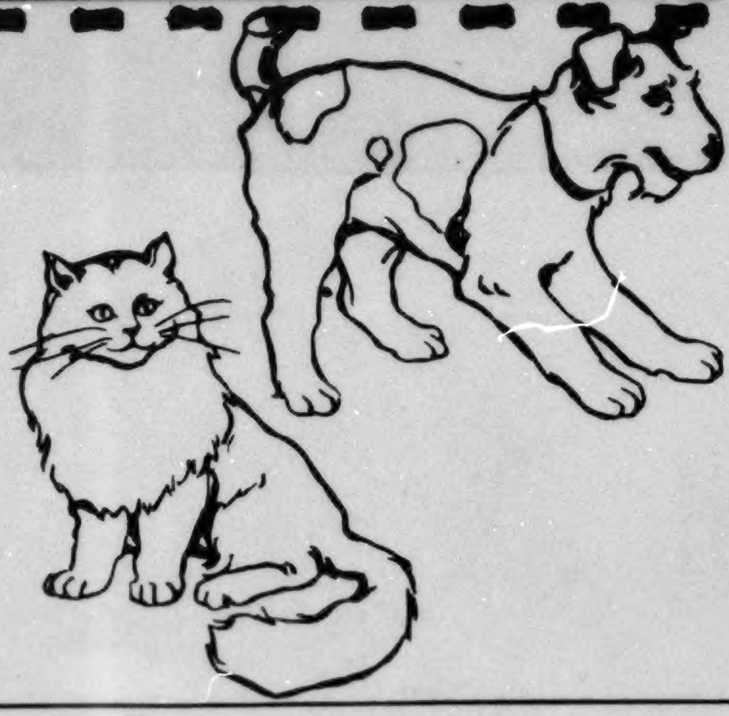
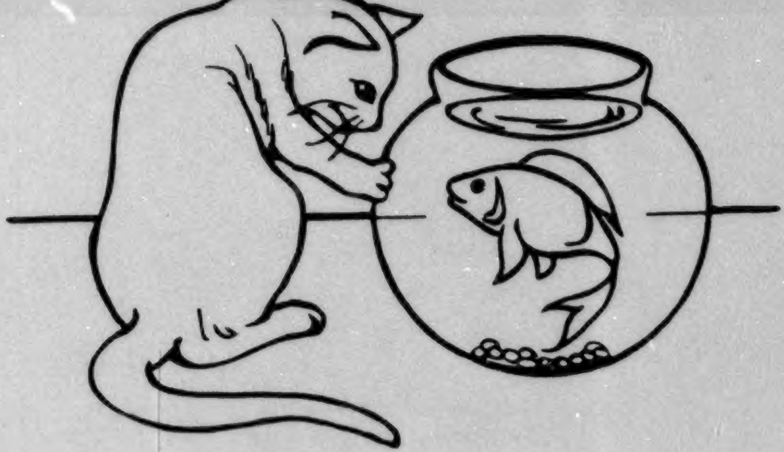
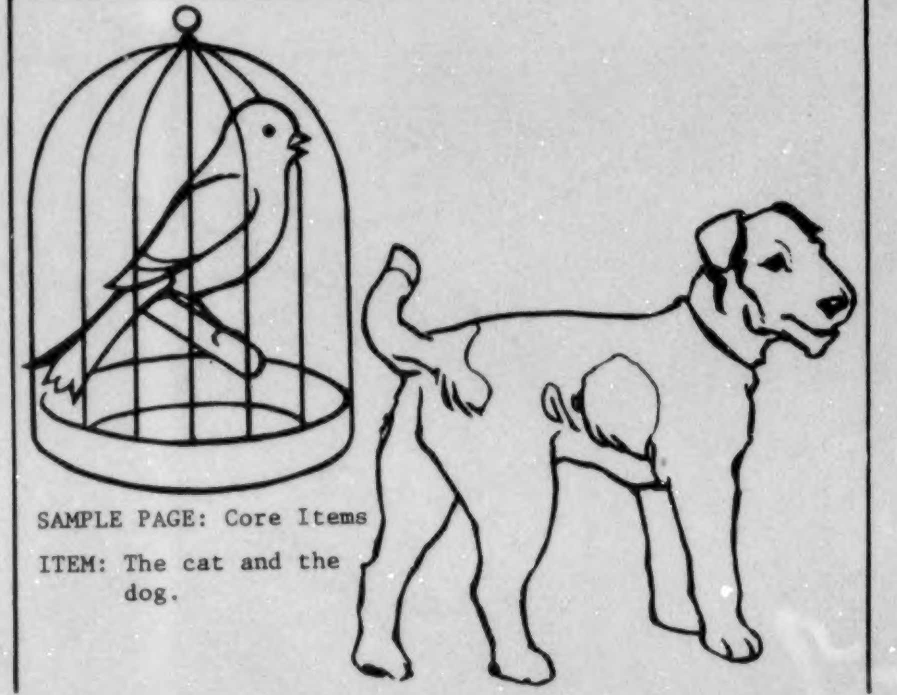
APPENDIX A

Sample pages

Receptive Communication Scale

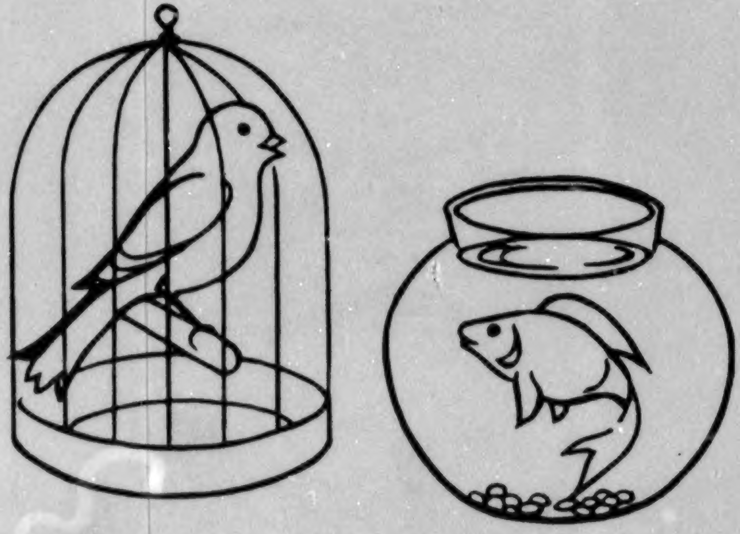


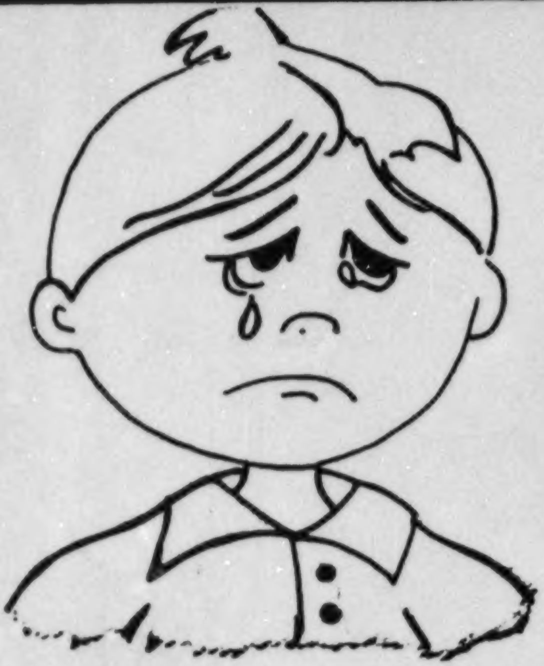


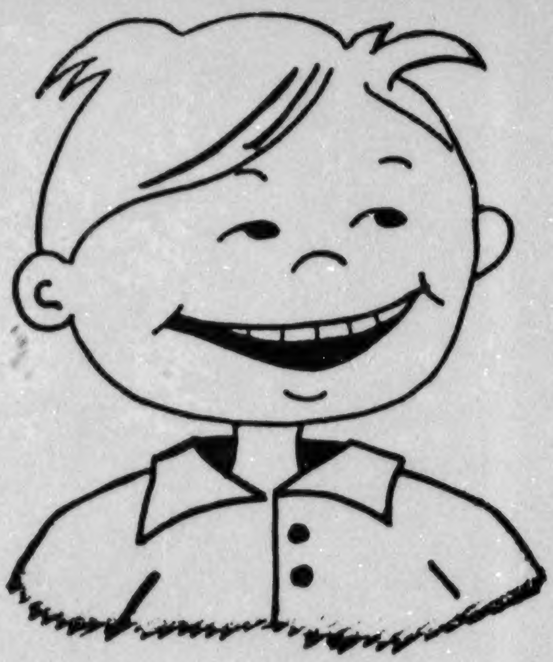


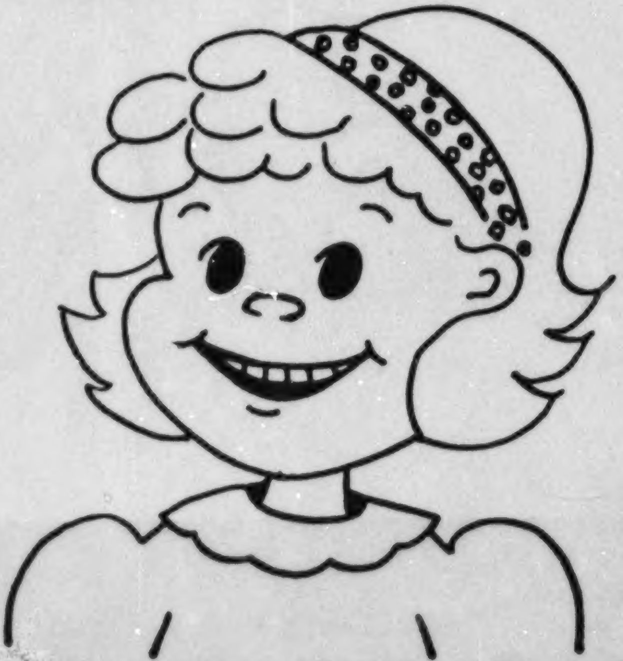
SAMPLE PAGE: Core Items

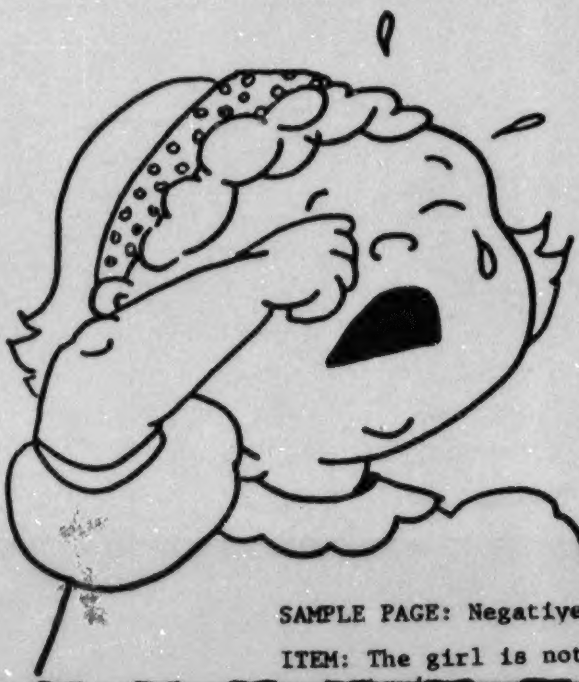
ITEM: The cat and the dog.





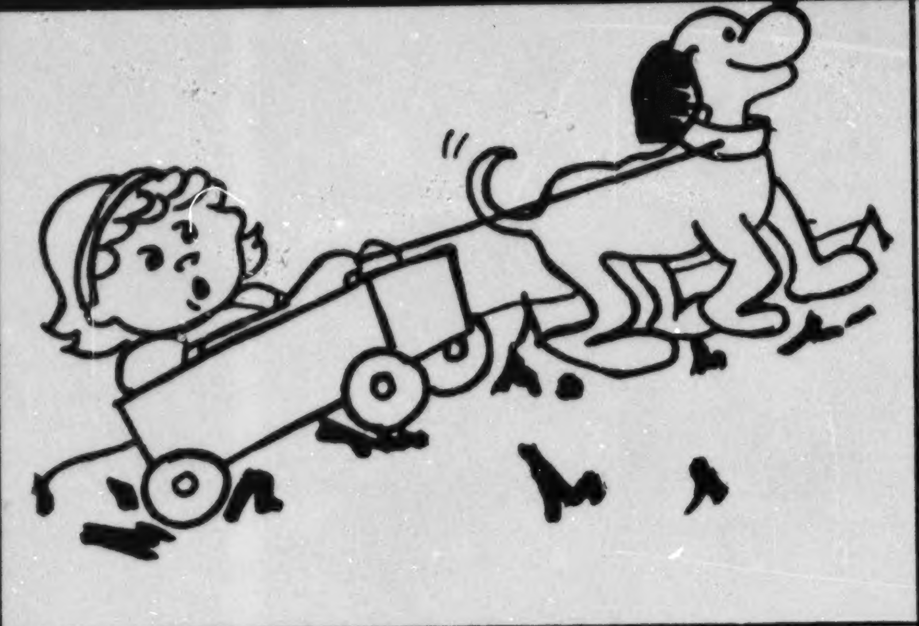


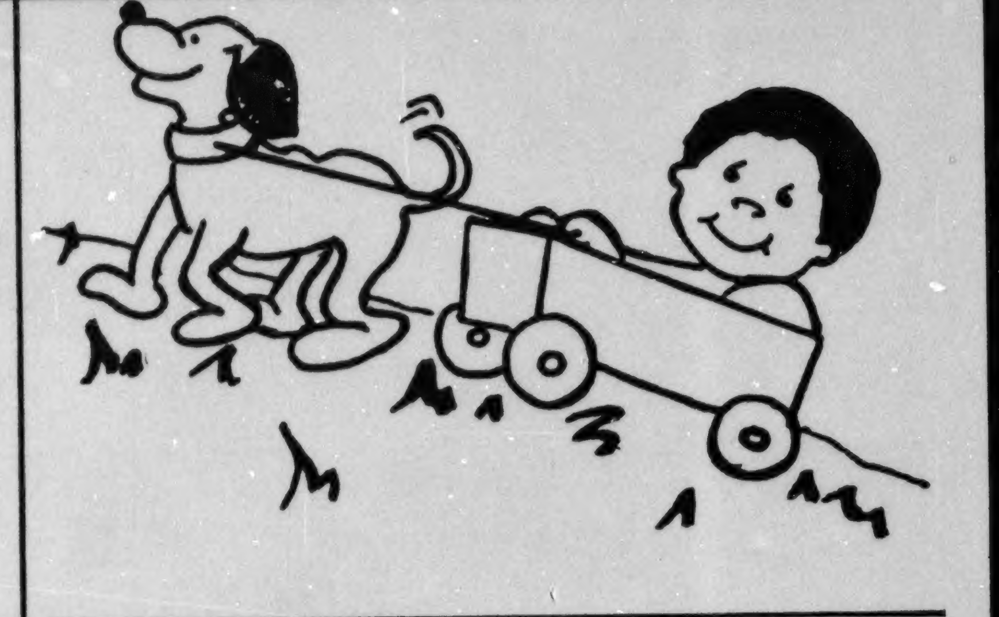


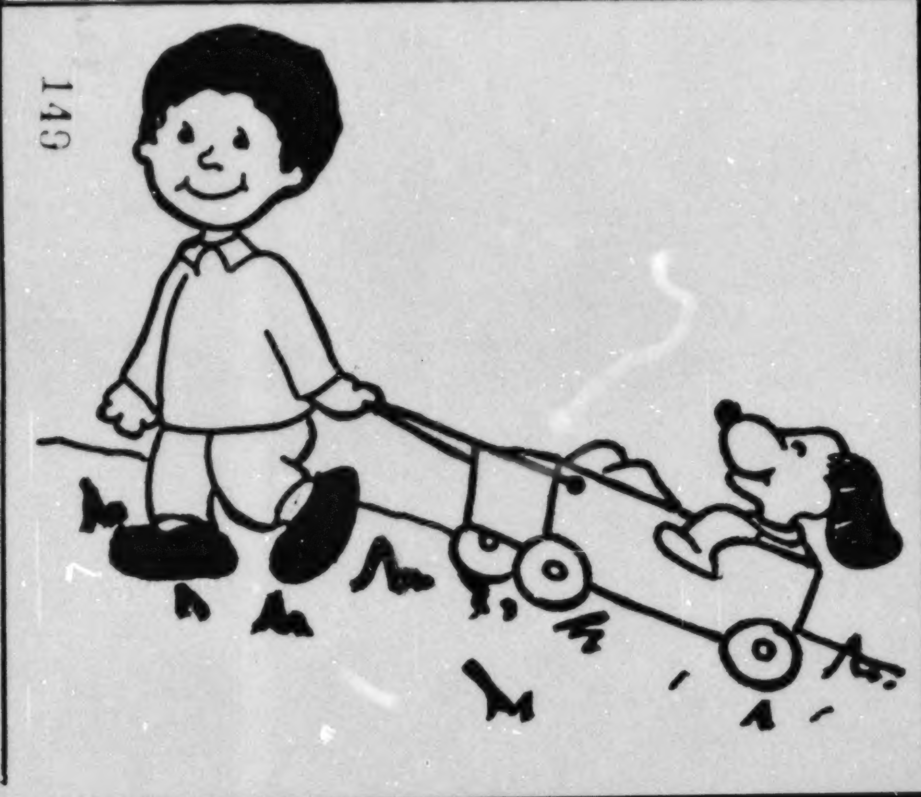


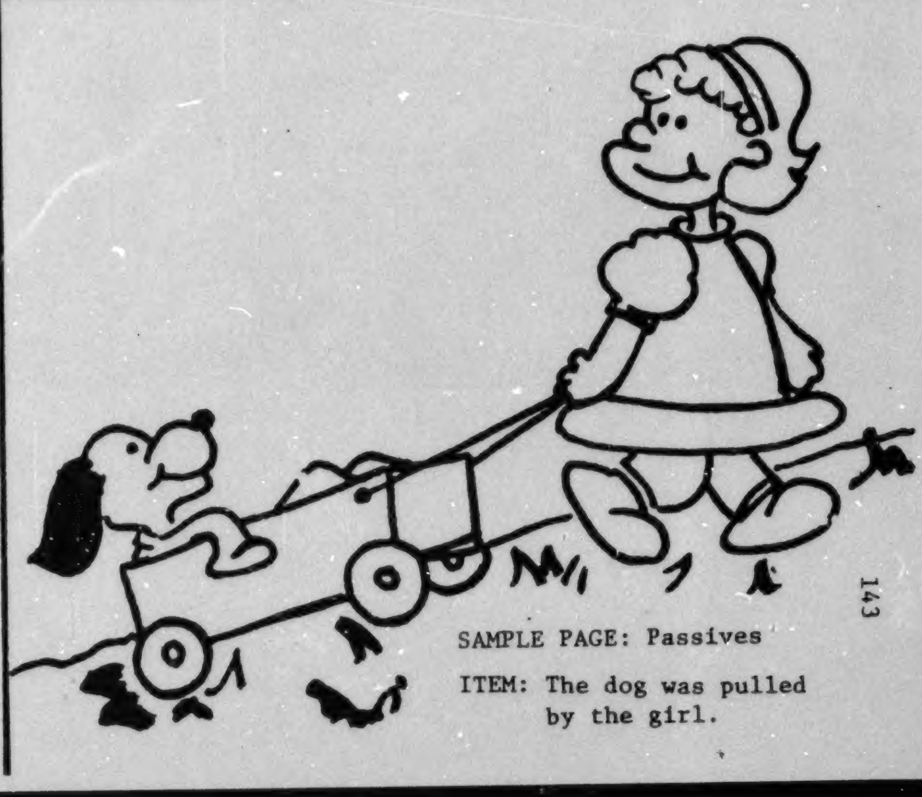
SAMPLE PAGE: Negatives

ITEM: The girl is not



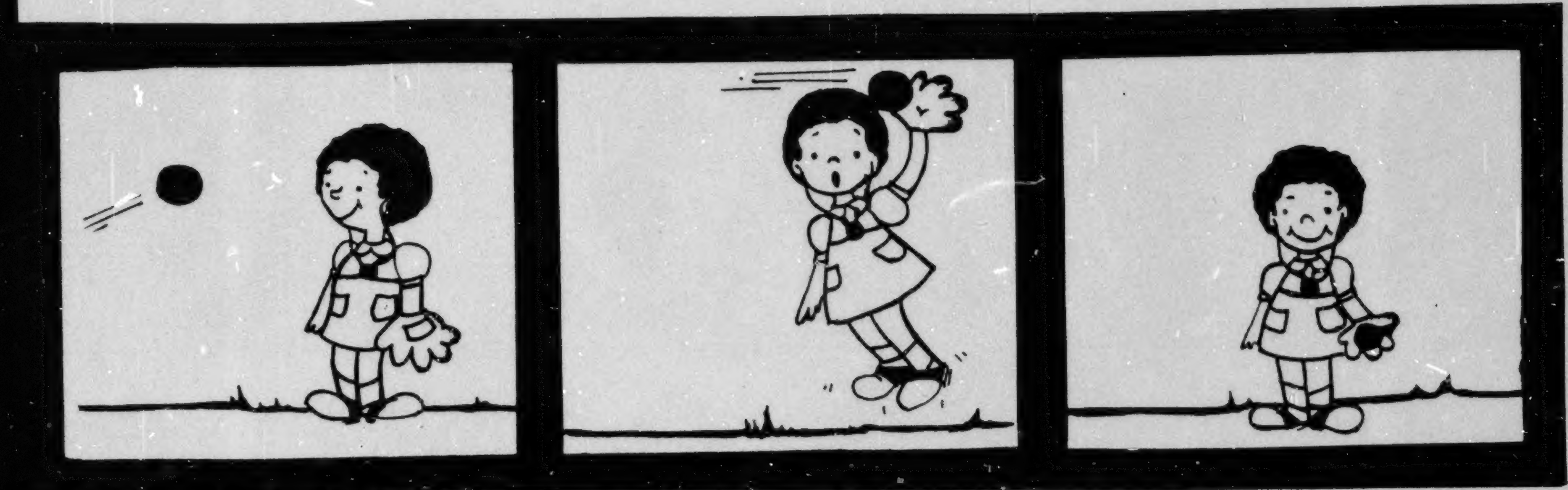






SAMPLE PAGE: Passives

ITEM: The dog was pulled
by the girl.



SAMPLE PAGE: Verb Tense

ITEM: The girl caught the ball.

(Illustration reduced to 60% of actual size)

RECEPTIVE COMMUNICATION SCALE
(Sample Scoring Sheet)

NAME:________________________________ DATE:________________________

SCHOOL:______________________________ AID:__________YES NO

1. 1 Table A B C D
2. The boy is not walking. A B C D
3. The red ball A B C D
4. The bird is over the tree. A B C D
5. The dog was splashed by the boy. A B C D
6. The nose and the mouth. A B C D
7. The man is washing. A B C D

8. The boy was pushed by the girl. A B C D
9. The boy is outside the house. A B C D
10. 4 hats A B C D
11. The boy is jumping. A B C D
12. The mother and the telephone. A B C D
13. The boy is not laughing. A B C D
14. The purple flower. A B C D

15. The girl is not crying. A B C D
16. The brown boat A B C D
17. The girl is running. A B C D
18. The apple is on the table. A B C D
19. 3 shoes A B C D
20. The dog was pulled by the girl. A B C D
21. The rabbit and the pig. A B C D

22. The milk and the cookie. A B C D
23. 5 chairs A B C D
24. The yellow cup A B C D
25. The woman is not sitting. A B C D
26. The baby is sleeping. A B C D
27. The cat is under the chair. A B C D
28. The boy was kicked by the horse. A B C D

29. The woman is eating. A B C D
30. The boy was hit by the girl. A B C D
31. The cat and the dog. A B C D
32. The green airplane. A B C D
33. The baby is in the bed. A B C D
34. 2 books A B C D
35. The man is not sleeping. A B C D

RECEPTIVE COMMUNICATION SCALE

VERBS

NAME:______________________ DATE:____________________

SCHOOL:____________________ AID:__________YES NO

1. The woman opened the door. A B C
2. The girl is spilling the milk. A B C
3. The girl will eat. A B C

4. The boy will jump. A B C
5. The man is working. A B C
6. The girl caught the ball. A B C

7. The girl will sit. A B C
8. The girl climbed the tree. A B C
9. The boy is pulling the wagon. A B C

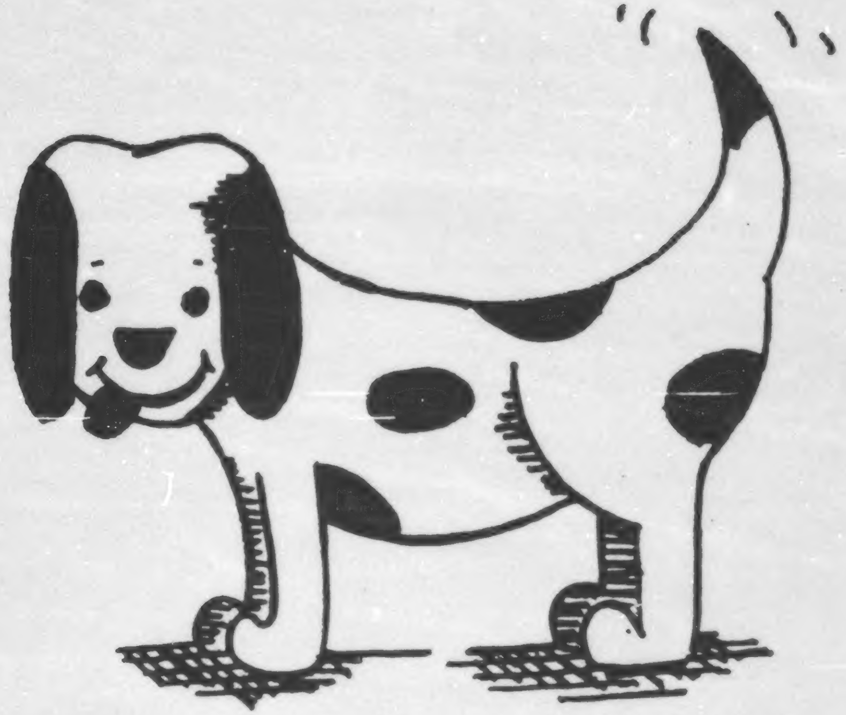
10. The woman is washing. A B C
11. The girl will push the boy. A B C
12. The boy fell. A B C

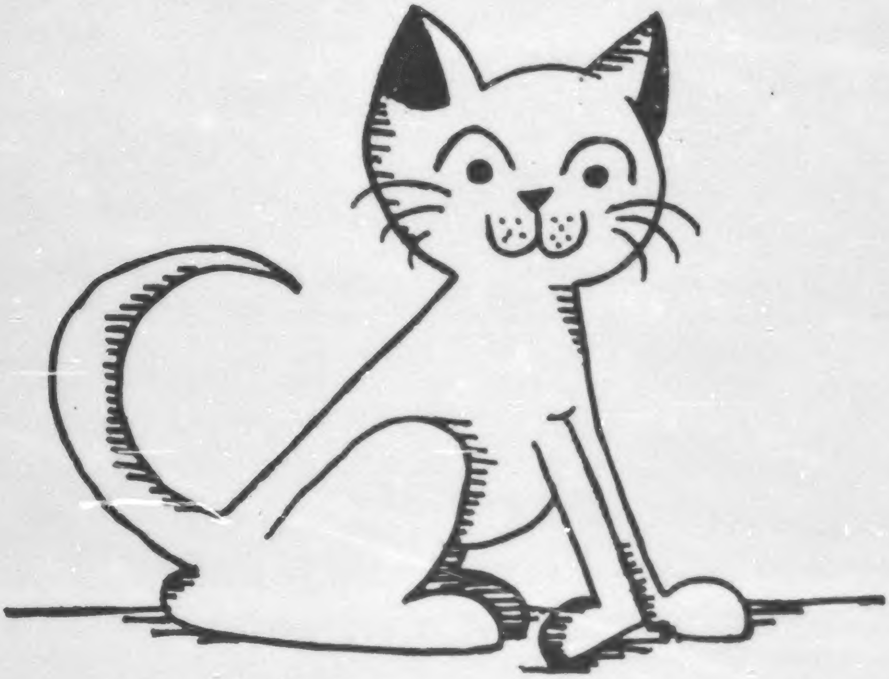
13. The girl is throwing the airplane. A B C
14. The boy will drop the ice cream. A B C
15. The boy carried the dog. A B C

APPENDIX B

Sample Stimuli

Articulation Test





Appendix C

Articulation Test - Raters' Word List

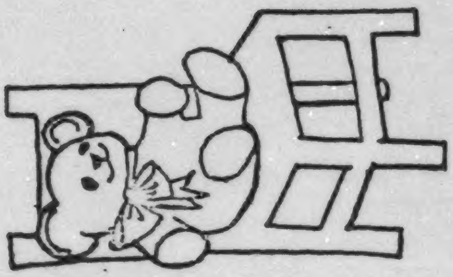
AIRPLANE
APPLE
BED
BIRD
BLUE
BOAT
BOOK
CAT
CUP
DISH
DOG
DOOR
EYE
FISH
FIVE
HAT
MAN
MILK
PIE
PIG
POP
RED
SHOE
TOP
TWO

APPENDIX D

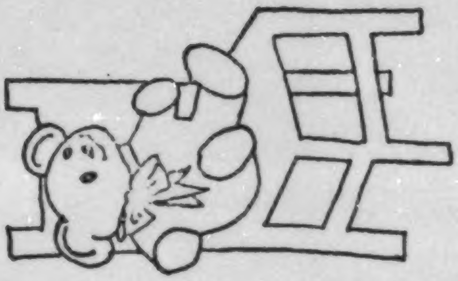
Sample Page

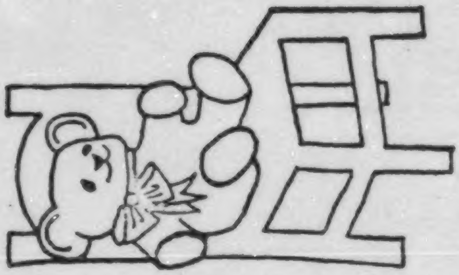
Matching Familiar Figures Test

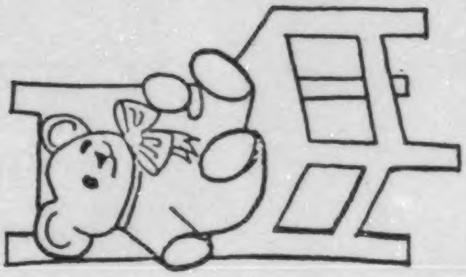
STANDARD

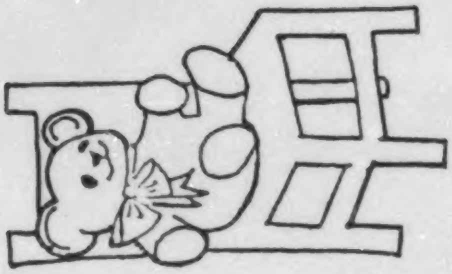


ALTERNATE CHOICES









APPENDIX E

Parent Information and Attitude Scale

PARENTAL INFORMATION AND ATTITUDE SCALE

FOR PARENTS OF HEARING IMPAIRED CHILDREN

Donald W. Brown, Ph.D.
Associate Professor
The Graduate School
Gallaudet College
Washington, D. C.

Name of organization or meeting at which you received this questionaire __________

____

GENERAL INFORMATION

Part I.

Note: Please do not put your name or address on this form. All information will be treated confidentially and will be used only for purposes of scientific research.

1. Sex: Male _____ Female _____ 2. Year of birth _____ 3. Year of marriage _____

4. Living with spouse at spouse at present time. Yes _____ No _____

5. Married more than once. Yes _____ No _____

6. If married more than once, was previous marriage ended because of:
Death _____ Divorce _____ Other (please state) _____

7. Draw a circle around the number of years of schooling you have completed.

12345678	1 2 3 4	1 2 3 4	1 2 3 4
Grade School	High School	College	Graduate Work

8. Religious affiliation:
______Protestant
______Roman Catholic
______Jewish
______Other
______None

9. Present family income (annual)

___________ under $3,000
___________ 3,000 to 4,999
___________ 5,000 to 6,999
___________ 7,000 to 8,999
___________ 9,000 to 10,999
___________ 11,000 to 14,999
___________ 15,000 or over

10. Husband's occupation (Be specific such as Drug Store Clerk, College Professor, Automobile Mechanic, etc.) ______________________________

11. Wife's occupation ______________________________
Full time ______ Part time ____

Note: In the following questions the child referred to is always your hearing impaired child.

12. Child's position in the family (1st born, 2nd, etc.) ______________________

13. Child's birthdate __________________ Age ______________________

14. Age of child when hearing loss occured ______________ was diagnosed ________

15. How many physicians or specialists did you visit before hearing loss was identified ________

16. Degree of child's hearing loss: Profound ____ Severe ____ Moderate ____
Mild ____ Average loss for speech frequencies (if known)
Right ear ____ dB Left ear ____ dB
Deaf ______ Hard of Hearing ______

17. To whom did you originally go when you suspected a hearing loss:
Pediatrician ________
General Practitioner ________
Audiologist ________
Friend or relative ________
Otologist ________
Hearing Aid Dealer ________
Speech & Hearing Center ________
Other ________

18. What diagnoses other than hearing loss were given; e.g. mental retardation, "slow development" ________
By whom ________

19. Who gave the diagnosis of hearing impairment? ________

20. Are any members of Wife's family deaf or hard of hearing (Do not include elderly relatives who lost hearing late in life)
Yes ______ State relationship ________ No. ______

21. Are any members of Husband's family deaf or hard of hearing
Yes ______ State relationship ________ No ______

22. When you were a youngster did you know any deaf children or adults?
Yes ______ No ______

23. During any part of your life have you known a deaf person? Yes ____ No ____
If Yes, give name(s) ________

24. Prior to the discovery of your child's hearing loss had you ever seen a magazine or journal about deaf children or adults? Yes ______ No ______
If Yes, give name(s) ________

25. Since learning of your child's impairment have you read any of the following: (Please check those which you have read)
______ American Annals of the Deaf
______ Deaf American (Silent Worker)
______ Exceptional Children
______ Books Specify title(s) ________
______ Teacher of the Deaf
______ Volta Review
______ Other

26. Do you subscribe to any of the above periodicals? Yes ______ No ______
If Yes, give name(s) and length of time during which you have subscribed.
____

NOTE: The following questions assume that your child is presently enrolled in a program for the hearing impaired. If this is not the case, answer the questions in terms of the program your child will be entering.

27. At what age did your child begin his education as a hearing impaired child

____.

28. Have you ever visited a school or class for hearing impaired children other than the one in which your child is enrolled? Yes ________ No ________
If Yes, please give name(s) ______________________________
Age level(s) of class(es) visited ______________________________

29. Please give the names of at least three other schools, classes, or programs (in this state) that your child could have been enrolled in if you had not chosen the one he is presently attending ______________________________
____
____

30. How did you first hear about the program your child is attending?
____
____

31. Did anyone encourage you to send your child to his present school?
Yes ____ No ____ If Yes, state relationship of the person(s) ____________
____

32. Have you visited your child's classroom? Yes ____ No ____ If Yes, approximately how many times ______________________________

33. Has anyone suggested that you enroll your child in a program other than the one he is attending? Yes ____ No ____ If Yes, what was the relationship of that person to you and what type of program(s) did he (she) suggest? ____________
____
____

34. Would you please rate the amount of confidence you have that you made the correct decision in placing your child in the program he is now attending:
________ Very confident
________ Fairly confident
________ Slight lack of confidence
________ Serious lack of confidence

35. Have you seen any television programs about deaf children or adults or with a deaf character? Yes ________ No ________

36. Which of the following conditions do you feel is the most educationally handicapped for a young child? (Check one)
________Deafness
________Blindness
________Cerebral Palsy
________Rheumatic Fever

37. What does the name Gallaudet mean to you? ______________________________
____

38. Are you a member of the Alexander Graham Bell Association for the Deaf?
Yes ______ No ______

39. Do you belong to any association of parents of deaf or hard of hearing children?
Yes ______ No _____ If yes, give name(s) ______________________________
____

40. Have you ever known a deaf person who is a parent of deaf or hearing children?
Yes ______ No _______

YOUR CHILD THIRTY YEARS FROM NOW

Part II.

What will your child be doing thirty years from now? Knowing your child, you may be able to make some good guesses. Place an (X) in the column which indicates the degree of chance you feel there is that the statement will be a true description of your child thirty years from now. If you and your spouse disagree, give both answers and place an (H) after husband's choice and (W) for wife's.

	Very good chance	Fairly good chance	Some chance	A little chance	No chance at all
1. Will be a college graduate					
2. Will have speech that is easily understood by most people					
3. Will read at about fifth or sixth grade level or below					
4. Will use sign language as his preferred means of communication					
5. Will have more deaf friends than hearing friends					
6. Will be active in PTA, Rotary, Kiwanis or other similar organizations					
7. Will know his neighbors well					
8. Will be thought of as having normal hearing by people who meet him					
9. Will have graduated from a regular high school					
10. Will drive a car					
11. Will depend on speech reading more than on his hearing					
12. Will be married to a person with normal hearing					
13. Will be employed in a semi-skilled or skilled job rather than a profession					
14. Will be close to his brothers and sisters					
15. Will have difficulty in using English correctly					
16. Will be in good health					
17. Will use both oral and manual communication					
18. Will keep in touch with me					
19. Will belong to organizations of deaf and hard of hearing					

Part III.

Many statements and opinions have been expressed about hearing handicapped people. We are interested in learning the reactions that you, as the parent of a hearing impaired child, would have to the following statements. Please read each statement carefully. Circle the letter in front of the response which best expresses what you think of or would do about the statement.

In completing this form, please keep the following points in mind:

1. Everything you write will be kept confidential.
2. Try to circle one response for every question. (If you skip a statement, we will not know what you meant.)

1. Alexander Graham Bell, inventor of the telephone and strong supporter of teaching speech to deaf children, once said that finger spelling was the fastest and most efficient wqy to teach language to deaf children

   a. I think he was probably right
   b. I find it difficult to believe that he ever said that
   c. He meant this only for retarded or slow learning deaf children
   d. This is interesting but probably needs some research to prove it or disprove it
   e. Such a statement proves that he never truly believed in the importance of speech

2. Stuckless and Birch (University of Pittsburgh) report that their study has indicated that manual communication (sign language and finger spelling) does not hinder the development of speech in young deaf child

   a. I'd like to get the opinion of the principal of my child's school on that
   b. This is reassuring because I've wondered about that
   c. They probably didn't do a very careful study
   d. They mean that this is true if the child has already developed speech before he is exposed to manual communication
   e. This sounds like propaganda to me

3. There is so much disagreement about education of the deaf that the best thing to do is:

   a. Be sure I've picked the best school and then get information from that school's staff
   b. Read everything I can and then just trust that I've done the right thing
   c. Find out what approach has the most supporters and try that first
   d. Realize that what seems to be best for others may not be best for my child
   e. Read everything I can and then get the opinion of a school principal or superintendent

4. Some people have said that many fewer deaf people than hearing people are able to go to college

   a. This is probably true because of the deaf child's difficulty in learning
   b. This is only true if the deaf child gets the wrong elementary education
   c. Colleges shouldn't be allowed to discriminate against the deaf that way
   d. Those people are talking about previous generations and are unaware of current progress
   e. This seems quite logical to me

5. Alexander Graham Bell said, "I think the use of the sign language will go out of existance very soon".

   a. This has happened
   b. This statement just shows how wrong Bell could be
   c. This will happen soon because of our better teaching methods
   d. Bell would never have said that
   e. This is why it is unnecessary for my children to learn signs

6. Most deaf people marry a deaf person

   a. This is not true
   b. If this is true, it is because of the communication barrier imposed by deafness
   c. This is true only if the deaf have been segregated from contact with hearing people
   d. This is fine if it's what the deaf want
   e. This will not be true of my child because we're treating him as a normal person

7. If a friend of mine discovered that her child was deaf

   a. I'd tell her about the school my child is in
   b. I'd suggest some things she should read about the different types of programs
   c. I would sympathize with her but not interfere with her right to make her own decision
   d. I'd try to get to her before people filled her with wrong information
   e. I would feel obligated to share with her the satisfaction I have now that I've found the right program

8. It is reported that many deaf adults who do not have intelligible speech are successfully employed and well adjusted.

   a. There are rare exceptions
   b. This does not surprise me
   c. They would be even more successful if they could speak
   d. I don't think this is true
   e. Statements like this should not be made as they will discourage parents from teaching their child to talk

9. An oral teacher of the deaf claims that many deaf children can't learn to speak and lipread.

   a. The statement is false and I can't believe a teacher would say that
   b. She probably doesn't know the methods used at my child's school
   c. That's true - she means retarded and visually handicapped deaf children
   d. She shouldn't be allowed to teach
   e. I agree - some can but many can't

10. One of the disadvantages of getting together with other parents whose children are in my child's school is:

    a. I know what they think - I want to hear the other side
    b. No one of us has the same problems as another parent
    c. There are no disadvantages
    d. It requires time away from my own family
    e. We might support each other's mistakes

11. A deaf adult says that he and his deaf friends don't think speech is very important.

    a. He and his friends probably have poor speech - sour grapes
    b. I can't imagine anyone, deaf or hearing, saying that
    c. Possibly he and his friends have found satisfactory adjustment without speech
    d. This is what can happen if a child is sent to the wrong type of school
    e. This is an unfortunate but very common statement

12. We all have too little time. Because of this I should devote my short reading time to:

    a. Books and articles whose authors know what they're talking about
    b. Topics other than deafness because I have faith in my child's school
    c. Learning about methods of teaching the deaf which I disagree with
    d. Controversial articles - so I can defend the correct approach
    e. Books on manual communication so I can get to know my child better

13. Most deaf people prefer to associate with other deaf people rather than hearing people.

    a. This is not true
    b. This will not be true of my child if I raise him right
    c. I imagine this is true - they understand each other's speech easier
    d. This is why deaf children should be taught with regular children
    e. If they are happy doing this - that's fine

14. The primary function of an educational program of hearing impaired children is to:

    a. Provide short term help which will enable the child to enter a regular school with hearing children
    b. Teach the children to hear better
    c. Develop speech and speechreading skills
    d. Provide appropriate instruction in academic skills, i.e., reading, language, writing
    e. Present opportunities for association with hearing children

APPENDIX F

Parent Check List

University of Minnesota
Research and Development Center
Donald F. Moores, Ph.D.

We are interested in evaluating ways in which people react to different words. On each page there is a different word to be judged by a number of pairs of adjectives. You should make a judgment for every adjective pair.

If you feel the word is very close to one end, you should mark your paper like this:

bad __X__: ______: ______: ______: ______: ______: ______: good

or

bad ______: ______: ______: ______: ______: ______: __X__: good

If you feel the word is close to one end but not extremely so, you should mark your paper like this:

strong ______: __X__: ______: ______: ______: ______: ______: weak

or

strong ______: ______: ______: ______: ______: __X__: ______: weak

If you feel the word is a little bit related to one adjective, you should mark your paper like this:

fast ______: ______: __X__: ______: ______: ______: ______: slow

or

fast ______: ______: ______: ______: __X__: ______: ______: slow

If you feel the word is not close to either adjective or that the adjectives make no sense with the word, you should mark your paper like this:

safe ______: ______: ______: __X__: ______: ______: ______: dangerous

POINTS TO REMEMBER

1. RESPOND TO EVERY LINE, DO NOT SKIP ANY.
2. DON'T CHECK ANY LINE MORE THAN ONCE.
3. WORK QUICKLY.
4. DON'T LOOK BACK OR TRY TO REMEMBER HOW YOU RESPONDED TO OTHER WORDS.
5. BE SURE TO MAKE YOUR MARKS ON THE LINES.

THIS NOT THIS

______: ______: __X___: ______: ______: ______:X______: ______:

PRESCHOOL

good _______:_______:_______:_______:_______:_______:_______ bad

sad _______:_______:_______:_______:_______:_______:_______ happy

dirty _______:_______:_______:_______:_______:_______:_______ clean

nice _______:_______:_______:_______:_______:_______:_______ awful

fair _______:_______:_______:_______:_______:_______:_______ unfair

disagreable _______:_______:_______:_______:_______:_______:_______ agreable

valuable _______:_______:_______:_______:_______:_______:_______ worthless

boring _______:_______:_______:_______:_______:_______:_______ fun

productive _______:_______:_______:_______:_______:_______:_______ unproductive

useful _______:_______:_______:_______:_______:_______:_______ useless

harmful _______:_______:_______:_______:_______:_______:_______ beneficial

important _______:_______:_______:_______:_______:_______:_______ unimportant

SPEECH

good _______:_______:_______:_______:_______:_______:_______ bad

sad _______:_______:_______:_______:_______:_______:_______ happy

dirty _______:_______:_______:_______:_______:_______:_______ clean

nice _______:_______:_______:_______:_______:_______:_______ awful

fair _______:_______:_______:_______:_______:_______:_______ unfair

disagreable _______:_______:_______:_______:_______:_______:_______ agreable

valuable _______:_______:_______:_______:_______:_______:_______ worthless

boring _______:_______:_______:_______:_______:_______:_______ fun

productive _______:_______:_______:_______:_______:_______:_______ unproductive

useful _______:_______:_______:_______:_______:_______:_______ useless

harmful _______:_______:_______:_______:_______:_______:_______ beneficial

important _______:_______:_______:_______:_______:_______:_______ unimportant

INTEGRATION OF A DEAF CHILD INTO A HEARING CLASS

good ______:______:______:______:______:______:______ bad

sad ______:______:______:______:______:______:______ happy

dirty ______:______:______:______:______:______:______ clean

nice ______:______:______:______:______:______:______ awful

fair ______:______:______:______:______:______:______ unfair

disagreable ______:______:______:______:______:______:______ agreable

valuable ______:______:______:______:______:______:______ worthless

boring ______:______:______:______:______:______:______ fun

productive ______:______:______:______:______:______:______ unproductive

useful ______:______:______:______:______:______:______ useless

harmful ______:______:______:______:______:______:______ beneficial

important ______:______:______:______:______:______:______ unimportant

SPEECHREADING--LIPREADING

good ______:______:______:______:______:______:______ bad

sad ______:______:______:______:______:______:______ happy

dirty ______:______:______:______:______:______:______ clean

nice ______:______:______:______:______:______:______ awful

fair ______:______:______:______:______:______:______ unfair

disagreable ______:______:______:______:______:______:______ agreable

valuable ______:______:______:______:______:______:______ worthless

boring ______:______:______:______:______:______:______ fun

productive ______:______:______:______:______:______:______ unproductive

useful ______:______:______:______:______:______:______ useless

harmful ______:______:______:______:______:______:______ beneficial

important ______:______:______:______:______:______:______ unimportant

HEARING AID

good ______:______:______:______:______:______:______ bad

sad ______:______:______:______:______:______:______ happy

dirty ______:______:______:______:______:______:______ clean

nice ______:______:______:______:______:______:______ awful

fair ______:______:______:______:______:______:______ unfair

disagreable ______:______:______:______:______:______:______ agreable

valuable ______:______:______:______:______:______:______ worthless

boring ______:______:______:______:______:______:______ fun

productive ______:______:______:______:______:______:______ unproductive

useful ______:______:______:______:______:______:______ useless

harmful ______:______:______:______:______:______:______ beneficial

important ______:______:______:______:______:______:______ unimportant

AUDITORY TRAINING

good ______:______:______:______:______:______:______ bad

sad ______:______:______:______:______:______:______ happy

dirty ______:______:______:______:______:______:______ clean

nice ______:______:______:______:______:______:______ awful

fair ______:______:______:______:______:______:______ unfair

disagreable ______:______:______:______:______:______:______ agreable

valuable ______:______:______:______:______:______:______ worthless

boring ______:______:______:______:______:______:______ fun

productive ______:______:______:______:______:______:______ unproductive

useful ______:______:______:______:______:______:______ useless

harmful ______:______:______:______:______:______:______ beneficial

important ______:______:______:______:______:______:______ unimportant

SIGNLANGUAGE

good ______:______:______:______:______:______:______ bad

sad ______:______:______:______:______:______:______ happy

dirty ______:______:______:______:______:______:______ clean

nice ______:______:______:______:______:______:______ awful

fair ______:______:______:______:______:______:______ unfair

disagreable ______:______:______:______:______:______:______ agreable

valuable ______:______:______:______:______:______:______ worthless

boring ______:______:______:______:______:______:______ fun

productive ______:______:______:______:______:______:______ unproductive

useful ______:______:______:______:______:______:______ useless

harmful ______:______:______:______:______:______:______ beneficial

important ______:______:______:______:______:______:______ unimportant

FINGERSPELLING

good _______:_______:_______:_______:_______:_______:_______ bad

sad _______:_______:_______:_______:_______:_______:_______ happy

dirty _______:_______:_______:_______:_______:_______:_______ clean

nice _______:_______:_______:_______:_______:_______:_______ awful

fair _______:_______:_______:_______:_______:_______:_______ unfair

disagreable _______:_______:_______:_______:_______:_______:_______ agreable

valuable _______:_______:_______:_______:_______:_______:_______ worthless

boring _______:_______:_______:_______:_______:_______:_______ fun

productive _______:_______:_______:_______:_______:_______:_______ unproductive

useful _______:_______:_______:_______:_______:_______:_______ useless

harmful _______:_______:_______:_______:_______:_______:_______ beneficial

important _______:_______:_______:_______:_______:_______:_______ unimportant

HEARING IMPAIRED

good ______:______:______:______:______:______:______ bad

sad ______:______:______:______:______:______:______ happy

dirty ______:______:______:______:______:______:______ clean

nice ______:______:______:______:______:______:______ awful

fair ______:______:______:______:______:______:______ unfair

disagreable ______:______:______:______:______:______:______ agreable

valuable ______:______:______:______:______:______:______ worthless

boring ______:______:______:______:______:______:______ fun

productive ______:______:______:______:______:______:______ unproductive

useful ______:______:______:______:______:______:______ useless

harmful ______:______:______:______:______:______:______ beneficial

important ______:______:______:______:______:______:______ unimportant

DEAFNESS

good ______:______:______:______:______:______:______ bad

sad ______:______:______:______:______:______:______ happy

dirty ______:______:______:______:______:______:______ clean

nice ______:______:______:______:______:______:______ awful

fair ______:______:______:______:______:______:______ unfair

disagreable ______:______:______:______:______:______:______ agreable

valuable ______:______:______:______:______:______:______ worthless

boring ______:______:______:______:______:______:______ fun

productive ______:______:______:______:______:______:______ unproductive

useful ______:______:______:______:______:______:______ useless

harmful ______:______:______:______:______:______:______ beneficial

important ______:______:______:______:______:______:______ unimportant

APPENDIX G

Longitudinal Test Data for Subjects with Unique Class Placement

Table

Child A

SEX: Male

ETIOLOGY: Menningitis

CA: 7 years 11 mos.

AGE OF ONSET: 2 years

HEARING LOSS: 95 db

Test Scores

	1971	1972	1973	1974
Leiter IQ	107			
WISC Performance IQ				117
ITPA	164	191	172	174
Receptive Communication		40%	72%	40%
Articulation		32%	24%	15%
MRT			46	
MAT				42

Table

Child B

SEX: Male

ETIOLOGY: Unknown

CA: 6 years 3 months

AGE OF ONSET: 1 1/2 years

HEARING LOSS: 80 db

Test Scores

	1971	1972	1973	1974
Leiter IQ	119			
WISC Performance IQ				107
ITPA	N.T.*	196	189	198
Receptive Communication		55%	88%	44%
Articulation		50%	84%	95%
MRT			36	
MAT				36

* Not Testable

Table

Child C

SEX: Female

ETIOLOGY: Rubella

CA: 6 years 5 months

AGE OF ONSET: Birth

HEARING LOSS: 78 db

Test Scores

	1971	1972	1973	1974
Leiter IQ	124			
WISC Performance IQ				110
ITPA	199	N.T.*	183	166
Receptive Communication		N.T.	52%	63%
Articulation		N.T.	52%	88%
MRT			44	
MAT				42

* Not Testable

Table

Child D

SEX: Male

ETIOLOGY: Fever

CA: 7 years 10 months

AGE OF ONSET: 1/2 year

HEARING LOSS: 83 db

Test Scores

	1971	1972	1973	1974
Leiter IQ	107			
WISC Performance IQ				115
ITPA	203	198	187	198
Receptive Communication		65%	62%	83%
Articulation		83%	62%	68%
MRT			37	
MAT				63

Table

Child E

SEX: Male

ETIOLOGY: Rubella

CA: 7 years 3 months

AGE OF ONSET: Birth

HEARING LOSS: 93 db

Test Scores

	1971	1972	1973	1974
Leiter IQ				
WISC Performance IQ				115
ITPA			193	154
Receptive Communication			80	77
Articulation		85%	81%	87%
MRT			47	
MAT				60

APPENDIX H

Classroom Observation Schedule

Classroom Observation (Revised)

Teacher: ______________________ Observer: ______________________

District ______________________ Date: __________ Time Start ______ Time Finish ______

No. of Children ______________________ Supporting Staff ______________________

DAILY PROGRAM

Listed below are a number of activities that may be included in the daily program of pre-kindergarten class. Indicate by number the sequence of activities in the session observed and the amount of time spent on each. Add activities not listed in spaces provided.

Order	Activity	Minutes	Order	Activity	Minutes	Order	Activity	Minutes
	F.S. expr.							
	F.S. rec.							
	Signing expr.							
	Signing rec.							
	Writing							
	Speech							
	Lipreading							
	Auditory Trng.							
	Reading Readiness							
	Number Work							
	Free play							
	Role Taking							
	Date & weather check							
	Group Discussion							
	Story time							
	Toileting							
	Snack							
	Rest period							

EQUIPMENT AND MATERIALS

Listed below are materials and equipment that may be found in a pre-kindergarten classroom. Check those seen in this classroom (x) and double check those used during the observation period (xx). Add items not listed in the spaces provided.

____ Large blocks

____ Small unit blocks

____ Books

____ Record player, tape recorder

____ Paints

____ Crayons

____ Pencils

____ Feltpens

____ Play dough

____ Clay

____ Scissors

____ Housekeeping corner

____ Dress-up clothes

____ Pupil name cards

____ Jungle gym, climbing ladder

____ Carpentry bench

____ Water play utinsils

____ Rhythm band instruments

____ Puppets

____ Wheel toys

____ Readiness workbooks

____ Readiness materials

____ Ditto masters

____ AV projectors

____ Overhead projector

____ Auditory unit

____ Audiograms

____ Pupil records

____ Color charts

____ Labels

____ Picture puzzles

____ Lotto games

____ Flannel board

____ Plants

____ Live animals

____ Manipulative toys

____ Northampton Chart

____ Fitzgerald Key

____ ____________________

____ ____________________

____ ____________________

____ ____________________

COMMUNICATION ANALYSIS

	Child to Child	Child to Teacher	Teacher to Child
Finger-Spelling	1 2 3 4 5 6 7*	1 2 3 4 5 6 7	1 2 3 4 5 6 7
Sign-language	1 2 3 4 5 6 7	1 2 3 4 5 6 7	1 2 3 4 5 6 7
Oral-Aural	1 2 3 4 5 6 7	1 2 3 4 5 6 7	1 2 3 4 5 6 7
Combined	1 2 3 4 5 6 7	1 2 3 4 5 6 7	1 2 3 4 5 6 7
Written	1 2 3 4 5 6 7	1 2 3 4 5 6 7	1 2 3 4 5 6 7
Gestures	1 2 3 4 5 6 7	1 2 3 4 5 6 7	1 2 3 4 5 6 7

* 1 - 7
Never to Frequently

	Child to Aide	Aide to Child
Finger-Spelling	1 2 3 4 5 6 7	1 2 3 4 5 6 7
Sign-Language	1 2 3 4 5 6 7	1 2 3 4 5 6 7
Oral-Aural	1 2 3 4 5 6 7	1 2 3 4 5 6 7
Combined	1 2 3 4 5 6 7	1 2 3 4 5 6 7
Written	1 2 3 4 5 6 7	1 2 3 4 5 6 7
Gentures	1 2 3 4 5 6 7	1 2 3 4 5 6 7

Never to Frequently

CLASSROOM ORGANIZATION

1. Teacher plans activities for the group as a whole. - - - - - 1 2 3 4 5 6 7

2. Teacher singles out individual children for: tutoring - - - - 1 2 3 4 5 6 7

3. supporting - 1 2 3 4 5 6 7

4. Teacher shifts the organizational pattern (individual - small groups - entire group) according to the activity. - - - - - - - - - - - - - - - - - - - 1 2 3 4 5 6 7

5. Teacher shifts the organizational pattern (individual - small groups - entire group) according to the needs of the children. - - - - - - - - - - - - - - 1 2 3 4 5 6 7

6. Spontaneous, independent work by the children does occur. - - 1 2 3 4 5 6 7

7. Spontaneous independent work by the children is allowed. - - 1 2 3 4 5 6 7

8. The program gives an impression of good planning. - - - - - - 1 2 3 4 5 6 7

9. The program appears to be well executed. - - - - - - - - - - - 1 2 3 4 5 6 7

USE OF SUPPORTING STAFF

10. Supporting Staff works in a supportive manner. - - - - - - - - 1 2 3 4 5 6 7

11. Supporting Staff performs housekeeping functions. - - - - - - - 1 2 3 4 5 6 7

12. Supporting Staff assists in maintaining discipline. - - - - - 1 2 3 4 5 6 7

13. Supporting Staff prepares teaching materials. - - - - - - - - - 1 2 3 4 5 6 7

14. Supporting Staff has responsibility for special portions of the educational program. - - - - - - - - - - - - - - - - - 1 2 3 4 5 6 7

15. Teacher and Supporting Staff function as a team, shifting responsibilities according to the needs of the children. - - 1 2 3 4 5 6 7

DISCIPLINE & CLASSROOM RELATIONSHIPS

*16. Teacher admonishes the children for misbehavior. - - - - - - - 7 6 5 4 3 2 1

*17. Teacher threatens and cajoles. - - - - - - - - - - - - - - - - - 7 6 5 4 3 2 1

*18. Teacher controls through reiteration of the expectations of "good" and "grown-up" boys and girls. - - - - - - - - - - - - 7 6 5 4 3 2 1

Never to Frequently

Never to Frequently

19. Conforming behavior is rewarded. - - - - - - - - - - - - - - - - 1 2 3 4 5 6 7

20. Teacher avoids problems by changing the pace of the program.- 1 2 3 4 5 6 7

21. Teacher quickly reprimands those who depart from the group pattern. - 1 2 3 4 5 6 7

22. The children cooperate readily. - - - - - - - - - - - - - - - - - 1 2 3 4 5 6 7

*23. A laissez-faire attitude prevails in the classroom. - - - - - 7 6 5 4 3 2 1

24. Teacher places restrictions on the childrens behavior. - - - 1 2 3 4 5 6 7

STRUCTURING PROGRAM

25. Teacher emphasizes diverse experiences for general enrichment.1 2 3 4 5 6 7

26. Children's activities have discernable objectives related to apparent needs. - 1 2 3 4 5 6 7

27. Teacher relies primarily on children's responses to determine her teaching goal at a given time. - - - - - - - - - - - - - - - 1 2 3 4 5 6 7

28. Teacher evidenced specific instructional goals. - - - - - - - - 1 2 3 4 5 6 7

29. Teacher focuses attention on the objectives: Through defining the time period of the activity. - - - - - - - 1 2 3 4 5 6 7

30. Through the use of special materials. - - - - - - - - - - - - - - 1 2 3 4 5 6 7

*31. Through prescribing the child's responses. - - - - - - - - - - 7 6 5 4 3 2 1

32. Teacher utilizes both enriching experiences and instructional activities. - 1 2 3 4 5 6 7

ENCOURAGING LANGUAGE AND SPEECH DEVELOPMENT

33. Teacher takes advantage of spontaneous language learning opportunities. - 1 2 3 4 5 6 7

34. Teacher makes provisions for language development: Through discussions, question and answer period. - - - - - - 1 2 3 4 5 6 7

35. Through planned exposure to concepts. - - - - - - - - - - - - - - 1 2 3 4 5 6 7

36. Teacher gives the child controlled practice in the use of selected terms and concepts in order to establish specified language patterns. - 1 2 3 4 5 6 7

Never to Frequently

Never to Frequently

REACTING TO PUPIL NEEDS

37. In planning and carrying out the program, teacher takes into account: The developmental status of the children. - - - - 1 2 3 4 5 6 7

38. The children's particular impairments. - - - - - - - - - - - - - - 1 2 3 4 5 6 7

39. Teacher modifies her behavior to the childrens' needs and reacts: In small groups - 1 2 3 4 5 6 7

40. Entire group - 1 2 3 4 5 6 7

41. Individually - 1 2 3 4 5 6 7

42. Teacher uses his capacity to receive childrens communications. - 1 2 3 4 5 6 7

*43. Teacher domineers - 1 2 3 4 5 6 7

Never to Frequently

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